A.4.1

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
We make Indiana a cleaner, healthier place to live

Frank O'Bannon
Governor

Lori F. Kaplan
Commissioner

100 North Senate Avenue
P.O. Box 6015
Indianapolis, Indiana 46206-6015
(317) 232-8603
(800) 451-6027
www.state.in.us/idem

COPY

VIA Certified Mail 7000 0600 0026 8337 8844

December 4, 2001

Mr. Boyd Wear
Warsaw Manufacturing Facility
P.O. Box 1388
Warsaw, Indiana 46581-1388

Dear Mr.Wear:

Re: Closure of Surface Impoundments
Dalton Foundries, Inc.
Warsaw, Indiana
IND 005146022

The Indiana Department of Environmental Management (IDEM) has received your certification dated December 6, 1994 and subsequent addendums dated September 14, 2001, and November 12, 2001, that total closure has been completed as outlined in the approved closure plan for Dalton Foundries. With the receipt of this certification, total closure is complete as required by 40 CFR 264 Subpart G.

Dalton originally notified the U.S. EPA, Region 5, as a hazardous waste generator. The approved closure plan indicated that the surface impoundment treatment has been eliminated. With the completion of closure, the facility status is now classified as a generator.

If you have any questions about this letter, please contact Ms. Michelle Timmermann at 317/232-3264.

Sincerely,

Thomas E. Linson, Chief
Permits Branch
Office of Land Quality

cc: Kosciusko County Health Department
IDEM Northern Office
Ms. Jenny Dooley, IDEM
Mr. Bruce Kizer, IDEM
Ms. Kim Vedder-Risch, IDEM
Mr. Craig Barker, IDEM
Mr. Eric Emmett, August Mack

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VIA CERTIFIED MAIL 7000 0520 0023 5041 4498 November 28, 2001

Mr. Boyd A. Wear, Director
Dalton Foundry
Warsaw Manufacturing Facility
Plant Engineering
P.O. Box 1388
Warsaw, Indiana 46581-1388

Dear Mr. Wear:

Re: Inspection Results
Industrial Waste Management
Compliance Evaluation
Dalton Foundry
EPA I.D. No. IND005146022
Warsaw, Kosciusko County

Representatives of the Department of Environmental Management (Department) are conducting inspections of facilities in Indiana that are engaged in the generation, transportation, treatment, storage, or disposal of industrial waste. Facilities are being inspected to determine compliance with, but not limited to, "Environmental Management Act"; IC 13, "Indiana Administrative Code"; 329 IAC 3.1, "Hazardous Waste Management Permit Program and Related Hazardous Waste Management Requirements"; 329 IAC 3.1, "Solid Waste Land Disposal Facilities"; 329 IAC 10, 11 and 12, "Used Oil Management"; 329 IAC 13, and rules promulgated pursuant to those statutes. These inspections and record reviews are also being conducted pursuant to the requirements of the Resource Conservation and Recovery Act (RCRA), Public Law 94-580, as amended, for authorized state hazardous waste management programs.

This is to inform you that on October 24, 2001, I conducted an inspection of Dalton Foundry, Inc., located at Warsaw, Indiana. You represented your firm. For your information, a summary of the inspection report is provided below:

Type of Inspection:
__ Complete Industrial Waste Inspection
X Limited Industrial Waste Inspection
__ Complaint
__ Other:_____

Results of Inspection:

__ Additional information is required to evaluate overall compliance. You will receive a completed report within 30 days.

X In compliance, no violations observed.

__ In compliance, violations were observed but were corrected during the inspection. See inspection report.

__ Violations were observed and require a follow-up inspection. See inspection report. Re-inspection will be conducted after _____.

__ Violations were observed and require a submittal. See inspection report. Submittal is due _____.

__ Violations were observed and are being referred to our Office of Enforcement. See inspection report.

Please direct any response to this letter and any questions to me at (317)308-3163.

Sincerely,

Said Asgari

Said Asgari
Environmental Engineer
Technical Compliance Section
Compliance and Response Branch
Office of Land Quality

Enclosure
cc: Kosciusko County Health Department

Non-RCRA violations (open dumping, dumping in city sewer without pretreatment program, OSHA, etc.)

Additional Comments

SUBPART	B. GENERAL FACILITY STANDARDS	NA	NI	OK	DF
264/265.14	Security			✓	
264/265.15	General inspection requirements			✓	
264/265.16(a)	Personnel Training (Program Adequacy)			✓	
264/265.16(b) /	Personnel received training within six (6) months			✓	
264/265.16(c)	Personnel received annual review			✓	
264/265.16(d)	Training Documents: job titles, job description, type of training, training records			✓	
264/265.17				✓	
	C. PREPAREDNESS AND PREVENTION				
262.34 / 265.31	Maintenance & Facility Operation(must be maintained & operated to minimize possibility of release)			✓	
262.34 / 265.32	Required Equipment (a. Internal alarm/communication system b. External/telephone communication c. Fire extingishers and spill control equipment d. water/foam)			✓	
262.34 / 265.33	Testing & Maintenance of Equipment			✓	
262.34 / 265.34	Communication & Alarm Access			✓	
34 / 265.37	Local Authority Arrangements (police, fire, hospital)			✓	

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
HAZARDOUS WASTE LANDFILL INSPECTION REPORT

:E
☐ COI ☐ EFI ☐
☐ CDI ☐

Please Print
Facility Name: SAID ASGARI
Location: 1900 E JEFFERSON STREET
City: WARSAW County: KOSCIUSKO Zip: 46580

wishes to be contacted by OPPTA
No ☐
Inspectors Name: SAID ASGARI

LQG ☐	CEG ☐	NR ☐	UI ☐	Facility EPA I.D. Number	Inspector	Time	AM	PM	Date
equired YES ☐ NO ☒				IND 005 146 022 S.A.	SA	1030	✓		102401

A. GENERAL INFORMATION

Type and size of Operation

THERE ARE THREE SURFACE IMPOUNDMENTS (PONDS) AND SIX SLUDGE DRYING AREAS AT THE DALTON FOUNDRIES INC.. DALTON OWNS AND OPERATES A GRAY IRON FOUNDRY THAT MANUFACTURES CASTINGS FOR THE AUTOMOTIVE AND APPLIANCE INDUSTRIES. BETWEEN 1993 AND 1996, DALTON UPGRATED ITS WASTWATER TREATMENT SYSTEM, ELIMINATING THE NEED FOR THE WASTEWATER PONDS AND SIX SLUDGE DRYING AREAS. THESE AREAS ARE NOW CLEAN CLOSED AND CERTIFIED.

Hazardous Waste Streams

EPA #/ Description	Source/Process	Generation Rate	Disposition
Cadmium	FOUNDRY	—	—
Lead			
Barium			

	D. CONTINGENCY PLAN & EMERGENCY PROCEDURES	NA	NI	OK	DF
2.34 / 265.51	Contingency Plan for Facility			✓	
2.34 / 265.52	Contingency Plan Content (SPCC plan, local arrangements, emergency coordinator, equipment list, evacuation plan, etc.)			✓	
2.34 / 265.53	Contingency Plan Available (on-site, local distribution)			✓	
2.34 / 265.54	Contingency Amendments (when regulations change, if plan fails, when facility makes changes)			✓	
2.34 / 265.55	Emergency Coordinator available			✓	
2.34 / 265.56	Emergency Procedures followed			✓	

ana Hazardous Waste Rules, 329 IAC 3.1, incorporates by reference federal standards which have been published in the Code of Federal Regulations as 40 CFR 260 40 CFR 270. Citations reference the federal rules as incorporated, except where the State rule substitute full text language, in which case the specific 329 IAC 3.1 citatio sed.

ATTACH FACILITY MAP

Subpart N: Landfills

ments:_____

		265.301 Design and Operating Requirements	NA	NI	OK	DF
	265.301 (a)	Landfill units constructed after Jan. 29, 1992, must have double liners and leachate collection and removal system	✓			
	(b)	Must notify IDEM sixty days prior to receiving waste in a new unit	✓			
	(c)	Exemptions from (a)	✓			
	(d)	Monofills	✓			
	(e)	If liner leaks, replacement may be required	✓			
	(f)	Must have and maintain a proper run-on control system	✓			
	(g)	Must have and maintain a proper run-off control system	✓			
	(h)	Run-off and run-on collection and holding facilities must be emptied or managed expeditiously after storms to maintain capacity of system	✓			
	(i)	Wind dispersal of hazardous waste must be managed (daily cover)	✓			
		265.302 Action Leakage Rates				
	265.302 (a)	Landfill must submit proposed action leakage rate; rate must be established	✓			
	(b)	Requirements for action leakage rate (fluid head on liner must not exceed 1 foot)	✓			
	(c)	To determine if action leakage rate has been exceeded, landfill must convert weekly or monthly flow rate to average daily flow rate for each sump	✓			
		265.303 Response Actions				
	265.303 (a)	Landfill must submit response action plan which describes actions if action leakage rate is exceeded	✓			
	(b)	If action leakage rate is exceeded, landfill must: notify IDEM, submit assessment, determine leak parameters, determine actions, submit report	✓			
	(c)	To determine appropriate actions, facility must assess source of liquids	✓			
		265.304 Monitoring and Inspection Requirements				
	265.304 (a)	Landfills required to have a leak detection system must record amount of liquid weekly while active	✓			
	(b)	After final cover is installed, landfills must record liquid levels as required (monthly, quarterly, or semi-annual)	✓			
	(c)	Landfill must establish "pump operating level"	✓			
		265.309 Surveying and Recordkeeping				
	265.309 (a)	The landfill must maintain, on a map, the exact location and dimensions, including depth, of each cell with respect to permanently surveyed benchmarks	✓			
	(b)	The landfill must maintain, in the operating record, the contents of each cell and approximate location of each type of hazardous waste within each cell	✓			

	265.310 Closure and post-closure care	NA	NI	OK	DF
10(a)(1)	The owner/operator must cover the landfill/cell with a final cover. The cover must ne designed and constructed to:	✓			
(a)(2)	Minimize migration of liquids through the closed landfill	✓			
(a)(3)	Function with minimum maintenance	✓			
(a)(4)	Accommodate settling and subsidence so cover's integrity is maintained	✓			
(a)(5)	Have permeability less than or equal to bottom liner or subsoils	✓			
265.310 (b)	The owner/operator must comply with all post closure requirements in 275.117 through 265.120. The owner/operator must:	✓			
(b)(1)	Maintain integrity and effectiveness of the final cover, including making repairs to the cover as necessary to correct settling, subsidence, erosion, etc.	✓			
(b)(2)	Maintain and monitor leak detection system	✓			
(b)(3)	Maintain and monitor groundwater monitoring system	✓			
(b)(4)	Prevent run-on and run-off from eroding or damaging the cover	✓			
(b)(5)	Protect and maintain surveyed benchmarks	✓			
	265.312 Special requirements for ignitible or reactive wastes				
265.312 (a)	Ignitible or reactive wastes must not be placed in a landfill unless requirements of 40CFR 268 are met	✓			
(b)	Certain ignitible wastes in containers may be disposed in certain conditions	✓			
	265.313 Special requirements for incompatible wastes				
265.313	Incompatible waste must not be placed in the same landfill cell	✓			
	265.314 Special requirements for bulk and containerized liquids				
265.314 (a)	Pre-1985 disposal	✓			
(b)	Bulk or non-containerized hazardous waste with free liquids are prohibited from disposal after 1985	✓			
(c)	Containers with free liquids are prohibited	✓			
(d),(e),(f),(g)	Additional restrictions on liquids (test methods, sorbents, non-hazardous liquid)	✓			
	265.315 Special requirements for containers				
265.315 (a)	Containers must be 90 percent full when placed in the landfill; or	✓			
(b)	crushed, shredded, or similarly reduced in volume	✓			
	265.316 Disposal of small containers of hazardous waste in overpack drums (lab packs)				
265.316 (a)	Hazardous waste must be packaged in non-leaking inside containers	✓			
(b)	Inside containers must be overpacked in DOT-approved drum with sufficient amount of sorbents	✓			
(c)	Sorbent material must be appropriate	✓			
(d)	Incompatible wastes must not be placed in same container	✓			
(e)	Reactive waste must be treated or rendered non-reactive	✓			
(f)	Disposal must be in compliance with 40 CFR 268	✓			

Indiana Department of Environmental Management
VERIFICATION OF INSPECTION

This is to verify that on 10/24/01 an inspection of DALTON CORPORATION was conducted by the undersigned representative of the Indiana Department of Environmental Management, Office of Land Quality.

Type of Inspection:

_____ Complete Industrial/Hazardous Waste Inspection
_____ Limited Industrial/Hazardous Waste Inspection
_____ Industrial Waste Landfill Inspection
_____ Complaint
_____ Multi-Media Screening Evaluation
_X_ Other ~~HW LANDFILL~~ SURFACE IMPOUNDMENTS

Inspection Findings:

_X_ In compliance, no violations observed.

_____ In compliance, violations were observed but corrected during the inspection. See inspection report.

_____ Violations were observed and require a submittal and/or follow-up inspection. See inspection report.

_____ Violations were observed and are being referred to our Office of Enforcement. See inspection report.

_____ Additional information/review is required to evaluate overall compliance.

_____ Other _____.

Multi-Media Screening Checklist Finding:

_____ No potential problems or areas of possible non-compliance were observed and noted on the multi-media screening checklist.

_____ Potential problems or areas of possible non-compliance were observed and noted on the multi-media screening checklist, but corrected during the inspection. Refer to the final single-media inspection report and multi-media screening checklist.

_____ Potential problems or areas of possible non-compliance were observed and noted on the multi-media screening checklist, and will be referred to the Office(s) of _____ for further investigation and response. Refer to the final single-media inspection report and multi-media screening checklist.

If non-compliance is determined or additional information/review is required to evaluate overall compliance, the Office(s) of _____ will be the lead IDEM Office(s) in pursuing these matters.

Pollution Prevention:

Pollution prevention is the preferred means of environmental protection in Indiana. The goal of pollution prevention is to promote changes in business and commercial operation, especially manufacturing processes, so that less environmental wastes are generated. Your participation in Indiana's pollution prevention program is entirely voluntary. Would your company like to be contacted by IDEM's Office of Pollution Prevention and Technical Assistance? _____Yes _X_ No

A summary of violations and concerns noted during the inspection were verbally communicated to the undersigned company representative during the inspection. The company is encouraged to correct any deficiencies noted as soon as possible. Corrections made and verified during the inspection may still be cited as violations; however, prompt action may be taken into consideration in determining the resolution to any enforcement action, which may be taken.

__X__ Written report provided at the conclusion of the inspection. _____ Written report will be provided within 45 days.

IDEM Representative:

Printed Name	Signature	Phone Number	Date
SAID ASGARI	Said Asgari	(317) 308-3163	10/24/01

Company Representative:

Printed Name	Signature	Phone Number	Date
Boyd A. Wear	Boyd A. Wear	219-372-1837	10-24-01
Street/PO Box	City, State, Zip	Ownership	Fax Num
P.O. Box 1388	WARSAW, IN 46581	DALTON Corp.	

A Complete Industrial/Hazardous Waste Inspection evaluates a company's compliance with all applicable waste related rules and statutes. These include hazardous waste management requirements in the Resource Conservation and Recovery Act (RCRA), 40 CFR 260 - 279, Hazardous Waste Management Regulations, 329 IAC 3.1, Solid Waste Regulations, 329 IAC 10, 11, and 12, Used Oil Management, 329 IAC 13, Industrial Waste Statute, IC 13-20-7.5, and the Environmental Management Act, IC 13.

A Limited Industrial/Hazardous Waste Inspection evaluates a companies compliance in a specific area of applicable waste related rules and statutes (for specific rules and statutes see definition of a Complete Industrial/Hazardous Waste Inspection). This is sometimes referred to as a "focused" inspection. An inspection may be limited to a single rule or requirement of a rule or statute. Compliance with rules or statutes not evaluated is not implied. The inspection report will identify the extent of the inspection and the compliance status.

An Industial Waste Landfill Inspection evaluates a landfill's compliance with all applicable rules and statutes regarding the handling and disposal of Industrial waste.

A Complaint Investigation is in response to information received from the public, other agency, or internal agency referral. This inspection generally focuses on the allegation of non-compliance with waste related rules and statutes. The scope of the inspection may be expanded to a Complete Industrial Waste Inspection depending on the finding.

A Multi-Media Screening Evaluation is generally a complete or limited inspection in one program media (e.g., air, industrial waste, wastewater, drinking water) plus a screening

DALTON CORPORATION

10:30 A.M.

MR. BOYD A. WEAR

Land Ent

phase 1, 2 & 3

156.2 acres of facility (L.F. + pools + wetlands

several (5) - 2 drying beds & 3 pools

were closed closed in 1994 - 1995

~~Oct 1995~~

Contractors { 3 - 4 truck drivers
2-3 staff maintain the L.F.

AUGUST MACK ENVIRONMENTAL INC.
8007 CASTLETON ROAD
INDIANAPOLIS, INDIANA 46250
(317) 579-7400
(317) 579-7410 FAX

July 31, 2001

COPY

Mr. Victor P. Windle, Chief
Hazardous Waste Permit Section
Hazardous Waste Management Branch
Solid and Hazardous Waste Management
Indiana Department of Environmental Management
100 North Senate Avenue
Post Office Box 6015
Indianapolis, Indiana 46206-6015

Re: Certification of Completion of Post-Closure Care
RCRA Closure - Wastewater Ponds and Sludge Drying Areas
Dalton Corporation – Warsaw Manufacturing Facility
Warsaw, Indiana
IND 005146022
August Mack Project Number JB105.10

Dear Mr. Windle:

August Mack Environmental, Inc. (August Mack) has prepared this Certification of Completion of Post-Closure Care (Post-Closure Certification) on behalf of Dalton Corporation (Dalton). The attached Post-Closure Certification is being submitted in response to the completion of the post-closure groundwater monitoring requirements in accordance with 329 IAC 3.1-9-1 (40 CFR 264 *Subpart* F), as outlined in the approved Detection Monitoring Plan (DMP) dated August 25, 1995 and the IDEM's February 19, 1999 approval letter of the January 8, 1999 Closure Plan Amendment. A copy of IDEM's February 19, 1999 approval letter is provided in Attachment A.

A total of 13 semi-annual groundwater monitoring events were conducted beginning in October of 1995 and ending in April of 2001. Groundwater samples were collected from one background well and three compliance wells during each sampling event and analyzed for Barium, Cadmium, Lead, and Vanadium using Level IV Quality Assurance/Quality Control (QA/QC).

The results of the sampling events have been submitted to the IDEM in the Semi-Annual Groundwater Sampling Event Status Reports (Semi-Annual Reports), the most recent of which was submitted on August 1, 2001. During the post-closure groundwater monitoring program

barium was detected at concentrations ranging from 0.014 parts per million (ppm) to 0.49 ppm, which are below the approved criteria of 1.0 ppm as stated in the Closure Plan Amendment submitted by the IDEM on February 19, 1999 (see Attachment A). Cadmium and lead were not detected above laboratory detection limits in any of the groundwater samples collected throughout the post-closure groundwater monitoring program and are, therefore, below the USEPA Action Levels outlined in the approved DMP dated August 25, 1999. Vanadium was detected at concentrations ranging from <0.010 ppm to 0.040 ppm. As provided in the Semi-Annual Reports, statistical analysis has shown no significant difference between the vanadium concentrations in the background well and the compliance wells, in accordance with the requirements outlined in the approved DMP dated August 25, 1999, and the Closure Plan Amendment approval letter dated February 19, 1999.

Therefore, Dalton requests clean closure and release from financial assurance requirements of the Resource Conservation and Recovery Act (RCRA) wastewater ponds and sludge drying areas formerly located at the Dalton Corporation – Warsaw Manufacturing Facility located in Warsaw, Indiana. This clean closure request is based upon successful completion of the post-closure groundwater monitoring in accordance with the DMP and the Closure Plan Amendment as demonstrated in the Semi-Annual Reports previously submitted to your office.

Per 40 CFR 264.120, Attachment B includes a Certification of Completion of Post-Closure Care that has been signed by a Dalton representative and Mr. Timothy H. Dewitt, a registered professional engineer in the State of Indiana.

We trust that this submittal is responsive to your needs. Please contact us if you have any questions or require additional information.

Sincerely,

Tad Spaulding
Staff Scientist

Charles J. Staehler
Senior Engineer

Attachment

Cc: Boyd Wear – Dalton Corporation
Lisa McCoy – Dalton Corporation

ATTACHMENT A

CLOSURE PLAN AMENDMENT APPROVAL LETTER

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
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Governor

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VIA CERTIFIED MAIL P 126 003 956

February 19, 1999

Mr. Barry Fordanish
Dalton Corporation
Warsaw Manufacturing Facility
P.O. Box 1388
Warsaw, Indiana 46581-1388

Dear Mr. Fordanish:

Re: Closure Plan Amendment
Dalton Foundry
Warsaw, Indiana
IND 005146022

The Indiana Department of Environmental Management (IDEM) acknowledges receipt of a closure plan amendment request, submitted on your behalf by August Mack Environmental, dated January 8, 1999. The amendment request has been reviewed and approved with the following modification.

> If barium is detected in a monitoring well above the value found in Table 1 of 40 CFR 264 (1.0 ppm), the same criteria for action as stated in the first paragraph of page 44 of the Detection Monitoring Plan, dated August 25, 1995 will apply (e.g., if the detected value is above the Table 1 value, Dalton will repeat the sampling and comparison procedures, etc.)

The amendment request as modified supersedes the requirements of the closure plan approved February 26, 1996. If you wish to challenge this decision, IC 13-15-6-1 and IC 4-21.5-3-7 require that you file a Petition for Administrative Review.

If you have any questions regarding this matter, please call (800) 451-6027, press 0, and ask for Michelle Timmermann at extension 2-3264, or call 317/232-2364.

Sincerely,

Victor P. Windle, Chief
Hazardous Waste Permit Section
Hazardous Waste Facilities Branch
Solid and Hazardous Waste Management

cc: DeKalb County Health Department
Ms. Cheryl Frischkorn, IDEM
Mr. Craig Barker, IDEM

ATTACHMENT B

CERTIFICATION OF COMPLETION OF POST-CLOSURE CARE

CERTIFICATION OF COMPLETION OF POST-CLOSURE CARE

Dalton Corporation has completed the post-closure groundwater monitoring requirements in accordance with 329 IAC 3.1-9-1 (40 CFR 264, *Subpart* F), as outlined in the approved Detection Monitoring Plan dated August 25, 1995. The post-closure groundwater monitoring was conducted to obtain clean closure certification for the closure of the Resource Conservation and Recovery Act (RCRA) wastewater ponds and sludge drying areas formerly located at the Dalton Corporation – Warsaw Manufacturing Facility located in Warsaw, Indiana. I certify under penalty of law that the post-closure groundwater monitoring was conducted under my direction of supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the groundwater monitoring data that has been submitted. Based on my inquiry of the person or persons that supervised the post-closure groundwater monitoring activities, or the person or persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

IND 005146022
U.S. EPA I.D. Number

Timothy H. Dewitt
Name of P.E.

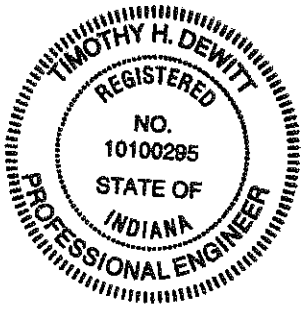
10100295
Registration Number

Dalton Corporation
Facility Name

Signature of Registered P.E.

Boyd Wear – Manager of Engineering
Name and Title

Signature of Owner/Operator



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July 31, 2001

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Hazardous Waste Management Branch
Solid and Hazardous Waste Management
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100 North Senate Avenue
Post Office Box 6015
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Per 40 CFR 264.120, Attachment B includes a Certification of Completion of Post-Closure Care that has been signed by a Dalton representative and Mr. Timothy H. Dewitt, a registered professional engineer in the State of Indiana.

We trust that this submittal is responsive to your needs. Please contact us if you have any questions or require additional information.

Sincerely,

Tad Spaulding
Staff Scientist

Charles J. Staehler
Senior Engineer

Attachment

Cc: Boyd Wear – Dalton Corporation
Lisa McCoy – Dalton Corporation

ATTACHMENT A

CLOSURE PLAN AMENDMENT APPROVAL LETTER

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
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VIA CERTIFIED MAIL P 126 003 956

February 19, 1999

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Dalton Corporation
Warsaw Manufacturing Facility
P.O. Box 1388
Warsaw, Indiana 46581-1388

Dear Mr. Fordanish:

Re: Closure Plan Amendment
Dalton Foundry
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The amendment request as modified supersedes the requirements of the closure plan approved February 26, 1996. If you wish to challenge this decision, IC 13-15-6-1 and IC 4-21.5-3-7 require that you file a Petition for Administrative Review.

If you have any questions regarding this matter, please call (800) 451-6027, press 0, and ask for Michelle Timmermann at extension 2-3264, or call 317/232-2364.

Sincerely,

Victor P. Windle, Chief
Hazardous Waste Permit Section
Hazardous Waste Facilities Branch
Solid and Hazardous Waste Management

cc: DeKalb County Health Department
Ms. Cheryl Frischkorn, IDEM
Mr. Craig Barker, IDEM

ATTACHMENT B

CERTIFICATION OF COMPLETION OF POST-CLOSURE CARE

CERTIFICATION OF COMPLETION OF POST-CLOSURE CARE

Dalton Corporation has completed the post-closure groundwater monitoring requirements in accordance with 329 IAC 3.1-9-1 (40 CFR 264, *Subpart* F), as outlined in the approved Detection Monitoring Plan dated August 25, 1995. The post-closure groundwater monitoring was conducted to obtain clean closure certification for the closure of the Resource Conservation and Recovery Act (RCRA) wastewater ponds and sludge drying areas formerly located at the Dalton Corporation – Warsaw Manufacturing Facility located in Warsaw, Indiana. I certify under penalty of law that the post-closure groundwater monitoring was conducted under my direction of supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the groundwater monitoring data that has been submitted. Based on my inquiry of the person or persons that supervised the post-closure groundwater monitoring activities, or the person or persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

IND 005146022
U.S. EPA I.D. Number

Timothy H. Dewitt
Name of P.E.

10100295
Registration Number

Timothy H. Dewitt
Signature of Registered P.E.

Dalton Corporation
Facility Name

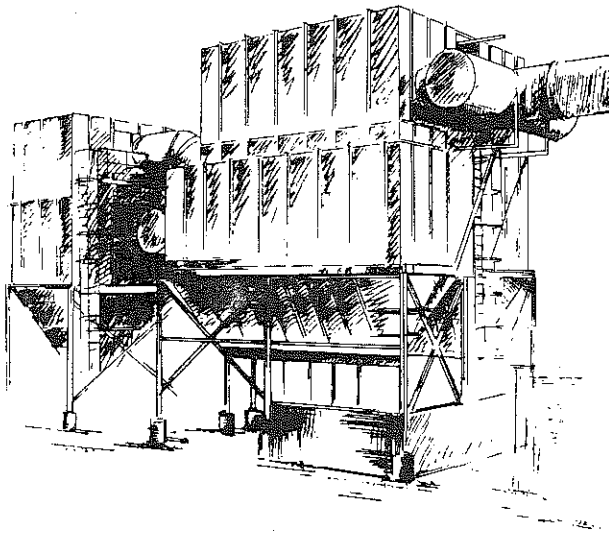
Boyd Wear – Manager of Engineering
Name and Title

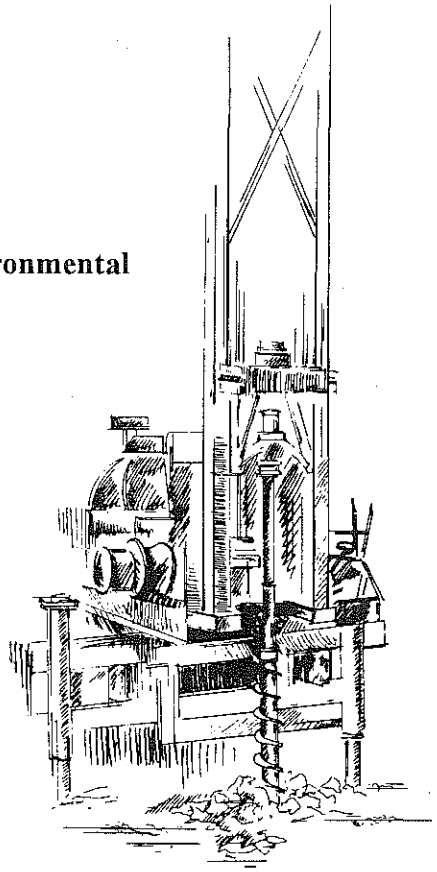
Signature of Owner/Operator

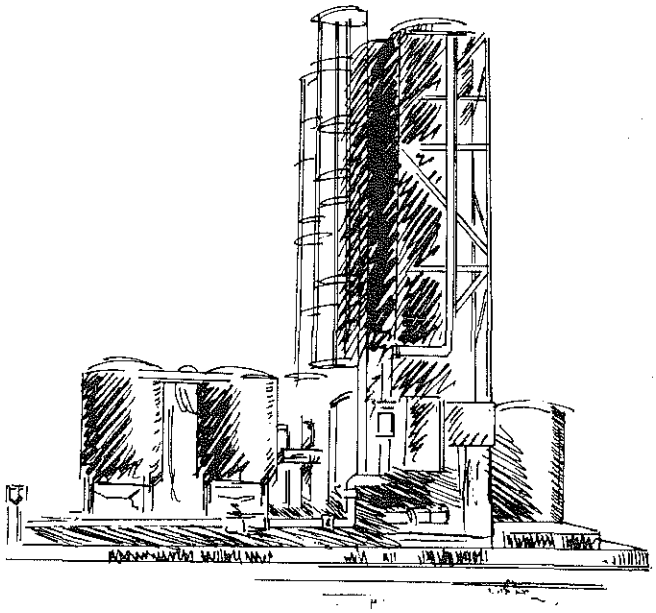
TIMOTHY H. DEWITT REGISTERED NO. 10100295 STATE OF INDIANA PROFESSIONAL ENGINEER

A.4.2

RCRA CLOSURE CERTIFICATION REPORT
WASTEWATER PONDS AND SLUDGE DRYING AREAS
THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA
IND 005461520







PREPARED FOR:
Indiana Department of Environmental Management

ISSUED:
December 6, 1996

AUGUST MACK ENVIRONMENTAL INC

Printed on recycled paper

AUGUST MACK ENVIRONMENTAL INC

8007 CASTLETON ROAD
INDIANAPOLIS, IN 46250
TEL: (317) 579-7400 FAX: (317) 579-7410

December 6, 1996

Victor P. Windle, Chief
Hazardous Waste Permit Section
Hazardous Waste Facilities Branch
Solid and Hazardous Waste Management
Indiana Department of Environmental Management
100 North Senate Street
Post Office Box 6015
Indianapolis, Indiana 46206-6015

Re: Wastewater Ponds and Sludge Drying Areas
The Dalton Foundries, Inc.
Warsaw, Indiana
IND 005461520

Dear Mr. Windle:

On behalf of The Dalton Foundries, Inc., August Mack Environmental, Inc. is pleased to submit the *RCRA Closure Certification Report* to document and certify closure activities conducted for the hazardous waste management unit (wastewater ponds and sludge drying areas) at the facility referenced above.

The closure was conducted in accordance with the August 1995 approved closure plan and modifications listed in the February 6, 1996, with the following variances that are described below.

1. Soil was excavated from sludge drying areas 1-W and 1-E prior to fully characterizing the soils in accordance with the sampling frequency described in the closure plan. The soils were excavated and disposed offsite at Dalton's permitted monofill.

2. In the initial phase of investigation, selected soil samples collected from sludge drying areas were analyzed vertically until one consecutive sample met the clean closure limits (CCLs), versus two consecutive samples. This was compensated for by excavating soil in these areas down to the water table. The soil was transported offsite to Dalton's permitted monofill for disposal.

3. After three phases of investigation to characterize the soils underlying the sludge drying areas 2-S and 3-W, the procedures in the closure plan were modified slightly to design an alternate soil boring program that more efficiently aided in determining the lateral and vertical extent of

soil impacts above the CCLs. Although this plan was not submitted to the IDEM for review, the program was successful in delineating the lateral and vertical extent of impacts, and all soils above the CCLs were subsequently excavated and disposed at Dalton's permitted monofill.

4. No duplicate or equipment blank samples were collected during the July 24, 1996 sampling event.

These variances did not affect the overall outcome of the closure activities, and all waste and soil above the CCLs were able to be excavated and properly disposed.

Please contact us if you have any questions or require additional information.

Sincerely,

Dan Longbrake

Daniel W. Longbrake
Senior Geologist

Bryan Danner

Bryan Danner, P.E.
Senior Engineer

cc: J. Corbett, Dalton
L. McCoy, Dutton & Overman

RRS
f:\users\dwl\dalton\clocov.doc

CLOSURE CERTIFICATION STATEMENT

The hazardous waste management unit(s) at the facility described in the closure plan has (have) been closed in accordance with the specifications in the approved closure plan.* I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons that manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

IND 005461520
U. S. EPA I. D. Number

The Dalton Foundries, Inc.
Facility Name

Dan E. Hirsch
Signature of Owner/Operator

Dan E. Hirsch, Plant Manager
Name and Title

Bryan Danner 12-6-96
Signature of Registered P.E.

Bryan Danner PE 19500132
Name of P.E. and Registration Number

12/06/96
Date

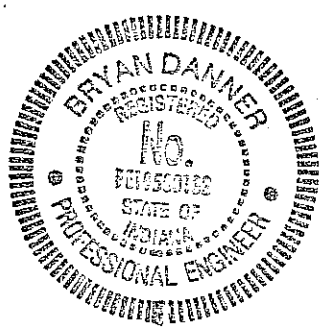
*Closed with the following variances to the approved closure plan described in the enclosed cover letter:

-Soil was excavated from sludge drying areas 1-W and 1-E prior to fully characterizing the soil;

-Selected initial soil samples were not analyzed vertically until two consecutive samples were below clean closure limits;

-An alternative sampling plan soil boring program was conducted to define the lateral and vertical extent of soil impacts for sludge drying areas 2-S and 3-W. The plan was not submitted to the IDEM for review and approval; and,

-No duplicate or equipment blank samples were collected for the July 24, 1996 event.



RCRA CLOSURE CERTIFICATION REPORT
WASTEWATER PONDS AND SLUDGE DRYING AREAS
THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA
IND 005461520

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THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA
IND 005461520

1.0 INTRODUCTION

August Mack Environmental, Inc. (August Mack) has completed the closure of three surface impoundments (ponds) and six sludge drying areas (drying areas) at The Dalton Foundries Inc. (Dalton) located in Warsaw, Indiana (Figure 1). Dalton owns and operates a gray iron foundry that manufactures castings for the automotive and appliance industries (Standard Industrial Code [SIC] 3321). Between 1993 and 1996, Dalton upgraded its wastewater treatment system, eliminating the need for the three wastewater ponds and six sludge drying areas. On June 7, 1994, Dalton approached the Indiana Department of Environmental Management (IDEM) with its intent to clean close these units in accordance with applicable Resource Conservation and Recovery Act of 1976 (RCRA) regulations. This report provides background information regarding Dalton operations, describes the procedures utilized to clean close the ponds and drying areas, summarizes the hydrogeologic conditions of the site, and provides conclusions regarding the closure status and post-closure care for the site. In addition, a Detection Monitoring Plan was also implemented as discussed in Section 4.0 of this report in order to monitor groundwater in the vicinity of the waste management area in compliance with 329 IAC 3.1-9-1 (40 CFR 264, Subpart F), to determine background groundwater quality, and determine if contaminants were present in the groundwater at statistically significant levels.

REVISIONS			
NO.	DATE	DESCRIPTION	DRAWN BY

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8007 CASTLETON ROAD
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FAX (317) 579-7410

DALTON FOUNDRIES, INC.
WARSAW, INDIANA

VICINITY MAP

PROJECT No.:	DATE:
95246.30	11/11/96
SCALE: 1"=2000'	DRAWN BY: DMM
	FIGURE: 1

2.0 SITE DESCRIPTION & BACKGROUND INFORMATION

Dalton began operations at this site in 1910 as a manufacturer of gray iron castings for the automotive and appliance industries. Dalton, an international company, provides products to Belgium, France, Germany, Japan and Mexico as well as the United States. Current customers within Indiana and the Midwest include Carrier Compressor Company, Caterpillar Incorporated, Copeland Industries and Simpson Industries. Dalton is an employee-owned company and currently occupies an approximately 16-acre plant site, employs approximately 800 people, and continues to manufacture gray iron castings.

As stated earlier, Dalton manufactures gray iron castings. Production processes currently in use at the facility include melting, pouring, casting, cooling, shakeout, coremaking, moldmaking, sand handling, grinding, finishing, packaging, shipping, and receiving. Dalton also has ancillary facilities for wastewater treatment and recycling. Raw materials include core and molding sand, core binders, bentonite, limestone, coke, and scrap steel. Dalton also currently maintains a National Pollutant Discharge Elimination System (NPDES) permit for discharge of non-contact cooling water (NPDES Permit IN0045578).

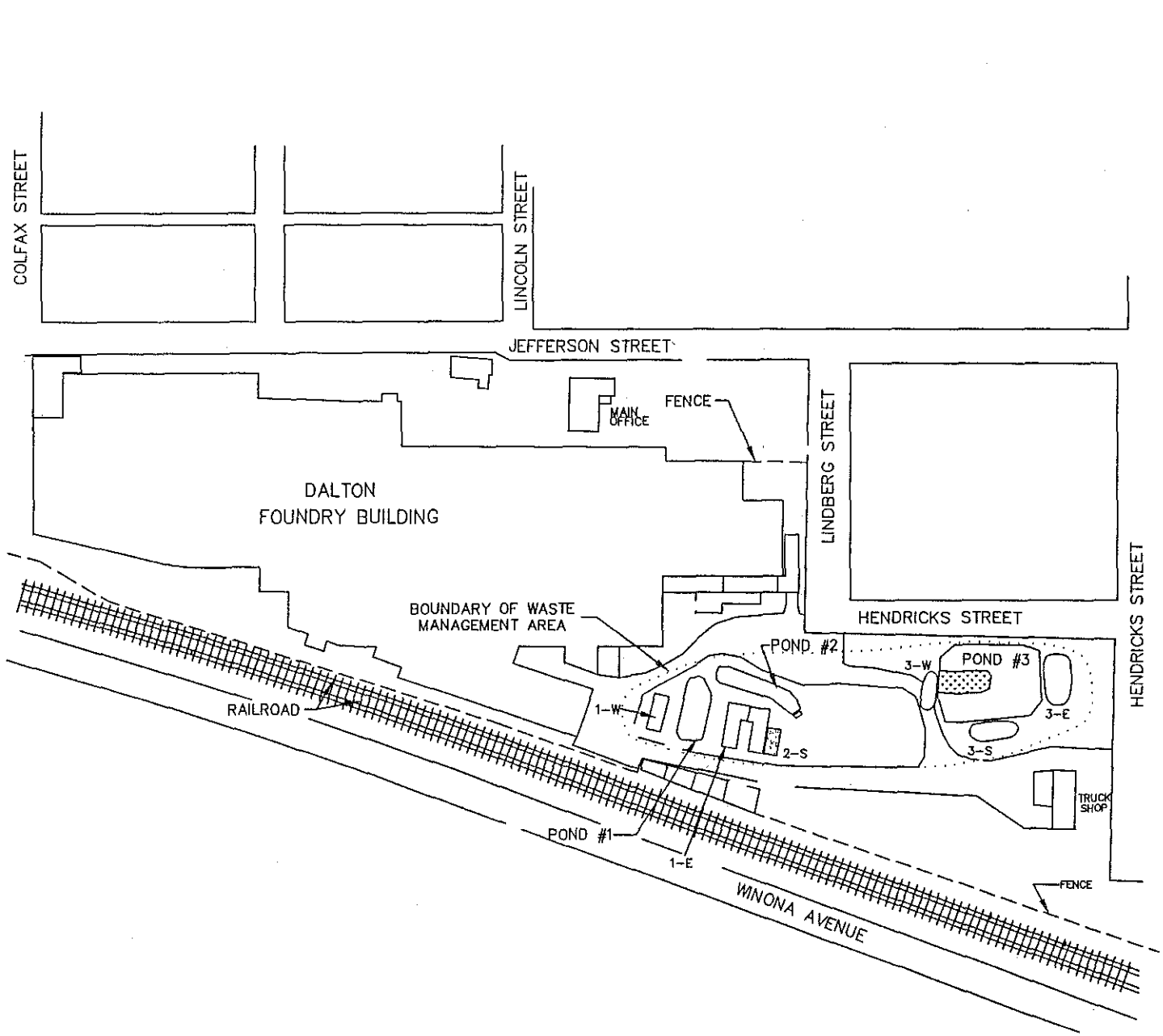
The Dalton facility is entirely fenced with three entrance gates on the east and one entrance gate on the west side of the property. All production occurs within the 270,000 square foot foundry building. A small truck repair and maintenance garage is located near the southeast corner of the plant site. The plant site topography slopes gently to the east with land surface elevations ranging

from approximately 822 feet to 825 feet above mean sea level (feet msl). A site plan depicting the layout of the plant site is included as Figure 2. A recent aerial photograph of the facility is provided as Figure 3.

Dalton is located in an area of mixed commercial, residential, and industrial development. The Dalton facility is bordered to the north by Warsaw Plating company, to the south by active Conrail railroad tracks, and to the east and west by residential areas. Stormwater runoff from the site either discharges to one of three storm water outfalls (General Permit Number INR00D002) or via sheet flow to storm sewers located east and west of the property.

2.1 Operational History for the Wastewater Ponds

In 1969, Dalton became the first foundry in Indiana to install air pollution control systems to control particulate emissions from its sand handling and cupola operations. These systems involve the use of wet scrubbers to remove particulate matter from the air stream prior to exhaust. Prior to closure of the pond system, the scrubber wastewater was discharged to a series of three holding ponds for primary, secondary, and tertiary solids settling prior to reuse as make-up water at the plant or discharge to the city of Warsaw publicly-owned treatment works. In accordance with Dalton's continuing commitment to environmental control and pollution prevention, the air pollution control and wastewater treatment systems have been upgraded and improved several times since their installation.



LEGEND

I-W	SLUDGE DRYING AREA DESIGNATION

REVISIONS			
NO.	DATE	DESCRIPTION	DRAWN BY

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FAX (317) 579-7410

THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA

SITE MAP

PROJECT No.:	DATE:
95246.30	11/02/95

SCALE:	DRAWN BY:	FIGURE No.:
1"=200'	HSW	2

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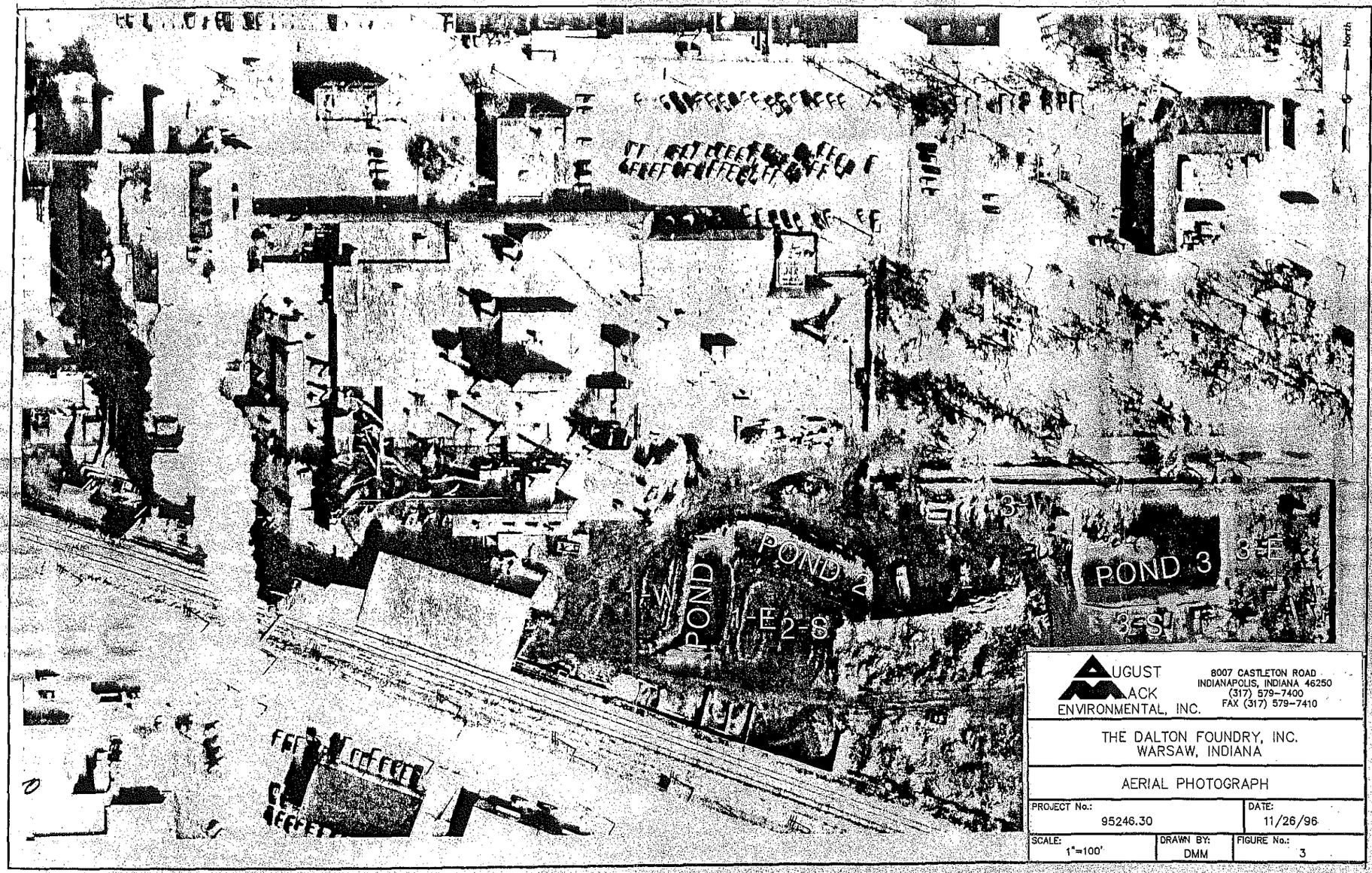

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THE DALTON FOUNDRY, INC.
WARSAW, INDIANA

AERIAL PHOTOGRAPH

PROJECT No.:		DATE:
95246.30		11/26/96
SCALE: 1"=100'	DRAWN BY: DMM	FIGURE No.: 3

As a part of normal operations, the ponds were periodically dredged of accumulated solids to restore their holding capacity. These dredgings were placed in sludge drying areas located immediately adjacent to the ponds until they were dewatered sufficiently to be transported off-site and disposed as Type II restricted waste at Dalton's permitted solid waste monofill (IDEM Operating Permit Number 43-6).

The IDEM established guidance for characterizing and disposing of restricted waste related to the foundry industry. Originally codified in Title 329 of the Indiana Administrative Code (IAC) 2-9-3, these regulations now appear in 329 IAC 10-7-3 and 4, and 10-9-4 (May 1, 1996). Initially, samples were analyzed for leaching potential using the Extraction Procedure Toxic (EP TOX) and the neutral leaching procedure. In 1990, Dalton switched from using EP TOX to analyzing samples using the toxicity characteristic leaching procedure (TCLP). The former and revised characterization test parameters and thresholds are presented below in Tables 1 and 2.

Table 1
EP TOX/TCLP Test Parameters

Chemical Parameter	Threshold Concentrations (in milligrams per liter)			
	Type IV	Type III	Type II	Type I
Arsenic	≤0.05	≤0.5	≤1.25/1.30	<5.0
Barium	≤1	≤10	≤25	<100
Cadmium	≤0.01	≤0.1	≤0.25	<1.0
Chromium	≤0.05	≤0.5	≤1.25/130	<5.0
Lead	≤0.05	≤0.5	≤1.25/1.30	<5.0
Mercury	≤0.002	≤0.02	≤0.05	<0.2
Selenium	≤0.01	≤0.1	≤0.25	<1.0
Silver	≤0.05	≤0.5	≤1.25/1.30	<5.0

≤ 1.25/1.30 denotes former and current threshold values, respectively

Table 2
Neutral Leaching Procedure Test Parameters

Chemical Parameter	Threshold Concentrations (milligrams per liter)			
	Type IV	Type III	Type II	Type I
Barium	≤1	≤10	≤25	*
Boron	≤2	≤20	≤50	*
Chlorides	≤250	≤2,500	≤6,250/6,300	*
Copper	≤0.25	≤2.5	≤6.25/6.3	*
Cyanide, Total	≤0.2	≤2	≤5	*
Fluoride	≤1.4	≤14	≤35	*
Iron	≤1.5	≤15	*	*
Manganese	≤0.05	≤0.5	*	*
Nickel	≤0.2	≤2	≤5	*
Phenols	≤0.3	≤3	≤7.5	*
Sodium	≤250	≤2,500	≤6,250/6,300	*
Sulfate	≤250	≤2,500	≤6,250/6,300	*
Sulfide, Total	≤1	≤5	≤12.5/13	*
TDS	≤500	≤5,000	≤12,500	*
Zinc	≤2.5	≤25	≤62.5/63	*
pH	6-9	5-10	4-11	*

* Testing is not required.
TDS = total dissolved solids
≤ 6,250/6,300 denotes former and current threshold values, respectively

As required, Dalton collected samples of the dredgings for analysis of the parameters listed above on a biannual basis. Copies of the laboratory reports and quality assurance/quality control (QA/QC) for the 1994 and 1992 characterizations are included in Appendix A. In addition to the waste characterization analyses performed, according to the IDEM foundry waste classification requirements, Dalton periodically sampled and analyzed the dried sludge for EP TOX and TCLP concentrations of cadmium and lead as these are the constituents most likely to affect the classification of foundry waste. These test results were originally presented to IDEM in an informational submittal on June 14, 1994. These data were summarized in tabular form and are included in Appendix B. These sample results have routinely revealed heavy metal concentrations

below the regulatory thresholds for hazardous waste characterization and the Type II criteria for foundry waste characterization and, as such, these materials have typically been managed as non-hazardous solid wastes.

In 1985, EP TOX testing of drying sludge from Pond 1 revealed for the first time cadmium and lead concentrations above the regulatory thresholds for hazardous waste (1 milligram per Liter [mg/L] and 5 mg/L, respectively). Dalton immediately notified IDEM and Region V of the United States Environmental Protection Agency (US EPA) and secured a hazardous waste generator identification number (IND005146022). The waste volume of approximately 450 tons was removed and transported to Michigan Disposal, a Subtitle C hazardous waste disposal facility (MID048090633).

In response to this event, Dalton reduced the volume of lead and cadmium introduced during the manufacturing process by improving the quality of the scrap that it purchased for melting (i.e. no lead tire weights). These modifications and restrictions minimized the potential for elevated levels of these constituents in the wastewater and dredgings, and upon implementation, were successful. Due to the overall improved quality of scrap material used by the facility and to modifications implemented in the wastewater treatment systems, the levels of lead and cadmium detected in the pond sludge and associated drying areas did not exceed the applicable regulatory thresholds from the period from August 1992 until the ponds were taken out of service.

In 1993, Dalton further improved its wastewater treatment system by installing a recycling system which eliminated the discharge of the cupola scrubber water to the pond system. This recycling system was further expanded in 1996, to include recycling of the scrubber water from the sand handling systems, eliminating the need for the ponds. The recycling system is comprised of a settling tank and three filter presses. The scrubber water from the cupola and sand handling systems is pumped into a 20,000-gallon capacity settling tank. Sludge that accumulates, is pumped to one of the three filter presses after passing through filter cartridges. The water fraction is pumped back to the settling tank for re-use, while the sludge dries in the filter presses. Periodically, the dried sludge is transferred into semi-trailers and transported to Dalton's permitted monofill for disposal. As the ponds were no longer needed, Dalton removed the ponds from service and clean closed the ponds and drying areas in accordance with the provisions of the approved RCRA Closure Plan dated August 25, 1995.

2.2 Description of Waste Management Area

The waste management area that was closed included three wastewater ponds and six associated sludge drying areas. The configuration of the management area (Ponds 1, 2, and 3 and drying areas 1-E, 1-W, 2-S, 3-E, 3-W, and 3-S) is shown on the site plan (Figure 2). As indicated previously, the ponds operated in series with the primary settling occurring in Pond 1. Pond 1 was constructed in 1969 and was approximately 85 feet long, 35 feet wide and about 11 feet deep. It had a maximum storage capacity of about 217,000 gallons and was lined with compacted clay along the base and sidewalls. The liner was originally approximately 10 inches thick along

the sidewalls and 15 inches thick along the base. Wastewater discharged by gravity from Pond 1 to Pond 2 via a plate weir into a 15 feet long concrete channel between the two ponds. The channel ranged in width from 2 to 6 feet and was about 6 inches deep.

Pond 2 was constructed in 1976 and was 120 feet long, 20 feet wide and about 8 feet deep. It had a maximum storage capacity of 157,000 gallons and was also lined with 10 to 15 inches of compacted clay along the base and sidewalls. Wastewater from Pond 2 discharged by gravity to Pond 3 via 230 feet of 8-inch diameter concrete tile.

Pond 3 was constructed by Indiana Briquetting in 1974 for stormwater retention. Indiana Briquetting leased this portion of the Dalton property until 1976 when Dalton occupied this part of the property. In 1978, Dalton brought Pond 3 into service as part of the wastewater settling system. Pond 3 was 135 feet long, 100 feet wide and about 7 feet deep. Pond 3 had a maximum storage capacity of about 564,000 gallons and had concrete sidewalls. It also contained a clay-lined base. The concrete sidewalls were about 3 inches thick, and the basal compacted clay liner was about 15 inches thick. During operation, the final effluent from Pond 3 was pumped at a maximum rate of 120 gallons per minute (gpm) for use as make-up water for the plant via 460 feet of 3-inch diameter polyvinyl chloride (PVC) pipe.

The sludge drying areas were temporary staging areas located adjacent to the ponds that were used for placement of dredged sludges for dewatering prior to off-site disposal. These areas were located directly adjacent to each pond, and each area was sloped to drain into the ponds (see

Figure 2). Two drying areas were adjacent to Pond 1 (1-E and 1-W), one area was adjacent to Pond 2 (2-S) and three areas were adjacent to Pond 3 (3-E, 3-W, and 3-S). The characteristics of each of the former drying areas are summarized in Table 3.

Table 3
Sludge Drying Area Characteristics

DRYING AREA	LENGTH (feet)	WIDTH (feet)	DEPTH (feet)	CAPACITY (Yd^3)
1-E	70	22	4	180
1-W	50	18	5	165
2-S	70	35	4	240
3-E	60	35	3	235
3-W	55	20	2	80
3-S	90	25	2	165

Yd^3 = cubic yards

The drying areas were in use only after dredging of the ponds. Therefore, sludge was present in the drying areas immediately after dredging until the sludge was sufficiently dried for transport and disposal. The ponds were dredged on an as-needed basis to maintain the necessary storage capacity to ensure proper operation of the settling and water recirculation systems. Pond 1 was dredged on a weekly or biweekly basis, Pond 2 was dredged on a monthly basis, and Pond # 3 was dredged every two to three years. Sludge was typically stored in the drying areas for a short period of time (usually one to two weeks) until it was sufficiently dewatered. Thus, the drying areas for Pond 2 and especially Pond 3 often did not contain sludge. All of these former drying areas were subjected to clean closure along with the ponds.

3.0 CLOSURE PROCEDURES

Due to the periodic exceedance of either EP Toxicity or TCLP thresholds, it was determined that the ponds would be closed under RCRA. In September 1994, Dalton submitted a RCRA Closure Plan for the wastewater ponds and associated drying areas. Based on comments issued by the IDEM, Solid and Hazardous Waste Management Division, the plan was modified in December 1994 and August 1995. On February 6, 1996, the IDEM issued a letter approving the Closure Plan and Detection Monitoring Plan (DMP) with modifications.

In September 1995 through October 6, 1996, clean closure of the wastewater ponds and sludge drying areas was conducted. The work was conducted in accordance with the August 1995 approved closure plan and modifications listed in the February 6, 1996 approval letter issued by the IDEM. Photographic documentation of closure activities is provided in Appendix C.

3.1 Removal of Residual Water in Wastewater Ponds

In April 1996, the ponds were taken out of service and the water remaining in the settling ponds was removed. Water remaining in Ponds 1 and 2 was pumped into Pond 3, and the water in Pond 3 was pumped back to the plant for use as make-up water in Dalton's wastewater treatment process via the existing 3-inch diameter PVC piping. This procedure was consistent with water usage during the operation of the ponds.

3.2 Clean Closure Limit Determination for Soil

In accordance with the procedures described in the approved August 1995 Closure Plan, background concentrations were determined for the target parameters of interest; cadmium, and lead. The calculated background concentrations, or Clean Closure Limits (CCLs), were calculated to provide a basis of comparison for characterizing the liner and underlying soils associated with the wastewater ponds. The Clean Closure Limit Determination report was submitted to the IDEM on May 6, 1996, and was approved on June 26, 1996. A summary of the background determination that was performed at the site is presented below. A copy of the IDEM letter is approving the CCLs included in Appendix D.

3.2.1 Determination of Lithologic Zones

In 1993-94, a hydrogeologic study was conducted in the area of the wastewater ponds and drying areas. The results of the study were presented on Pages 5 - 19 of the DMP. The study determined that three lithologic units were present above the uppermost aquifer. The uppermost zone (Zone 1) was encountered from land surface to approximately one to four feet below grade, and was comprised of primarily black foundry sand fill material. Generally, Zone 2 was encountered from four to eight feet below grade and was comprised primarily of sandy loam and silty sand. Zone 3 was encountered from eight feet below grade to the total depth of the borehole

and was comprised of medium-to-coarse-grained sand. CCLs were determined for each of these zones.

3.2.2 Soil Sampling and Analysis

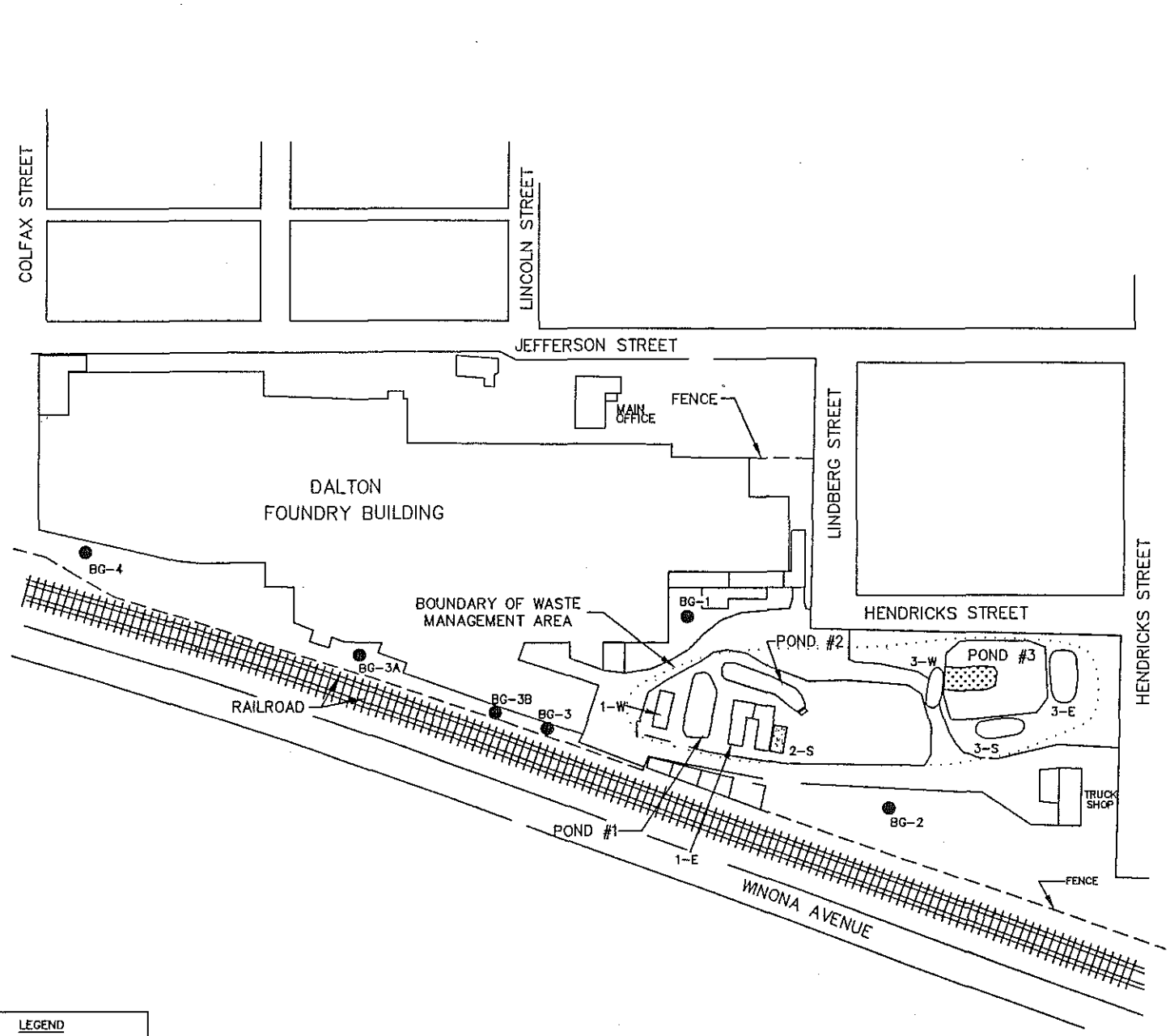
In accordance with the procedures described in the August 25, 1995 Closure Plan, four background borings were drilled at the locations shown on Figure 4. On September 26, 1995, Background Borings BG-1 through BG-4 were drilled on the site for purposes of collecting background soil samples. At Background Boring BG-3, Zone 2 (silty sand lithologic zone) was not encountered; therefore, only samples for Zones 1 and 3 were collected. In addition, concentrations of cadmium and lead did not appear to be representative of background conditions. Consequently, on November 11, 1995, Background Boring BG-3A was drilled on the site for purposes of collecting additional background soil samples. At Background Boring BG-3A, drilling continued to a depth of 16 feet below grade where the water table was encountered. Fill sand or silty sand lithologic zones were not encountered; therefore, only samples for Zone 3 were collected. On February 5, 1996, Background Boring BG-3B was drilled to collect samples for Zone 1 and Zone 2 in the vicinity of the general BG-3 area. The boring locations are shown on Figure 4.

The borings were performed using the Geoprobe® Direct Push Sampling System (Geoprobe®) in accordance with the procedures described in the Project Sampling and Analysis Plan (PSAP) (August 1995 Closure Plan, Appendix E). Soil samples were obtained using a 1.5-inch diameter,

24-inch long, stainless steel core barrel sampler equipped with an acetate liner. Soil samples were collected by hydraulically pushing the core sampler to the desired depth. The recovered samples consisted of an 18 to 24-inch section of undisturbed soil collected within the acetate liner inside the barrel. Subsequent samples were collected by lowering the sampler in the previously sampled hole and driving the sampler to a deeper target zone. After completion, the boreholes were backfilled with bentonite pellets.

The soil samples were visually inspected and lithologically described in accordance with the procedures described in the PSAP. General borehole drilling information also was included on the boring logs. The boring logs are included in Appendix E.

At each boring location, composite samples were collected from each lithologic soil horizon encountered above the naturally-occurring groundwater table (approximately 12 to 16 feet below grade) for analysis of total lead and cadmium by US EPA Methods 7421 and 7131, respectively.



LEGEND

3-S — DRYING/HOLDING AREAS

BG-1 — BACKGROUND BORING

REVISIONS			
NO.	DATE	DESCRIPTION	DRAWN BY

AUGUST MACK ENVIRONMENTAL, INC.
8007 CASTLETON ROAD
INDIANAPOLIS, INDIANA 46250
(317) 579-7400
FAX (317) 579-7410

THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA

BACKGROUND BORING
LOCATION MAP

PROJECT No.:	DATE:
95253.30	11/02/95

SCALE:	DRAWN BY:	FIGURE No.:
1"=200'	HSW	4

O:\DWGS\DALTON\95246.30\FIG4.DWG

3.2.3 Determination of Background Levels

A summary of the analytical results for the background soil samples is presented in Table 4.

TABLE 4
Summary of Analytical Results and
Calculated Background Levels for Background Soil Samples

Lithologic Zone	Analytical Results (reported in mg/Kg)						Mean (mg/Kg)	Standard Deviation (mg/Kg)	Background Level[2/] (mg/Kg)
	BG-1	BG-2	BG-3	BG-3A	BG-3B	BG-4			
Zone 1 - Fill Material									
Cadmium	2.3	21	~~28~~	NP	1.4	2.0	6.68	9.56	**35.36**
Lead	97	130	~~1,200~~	NP	220	94	135.25	58.81	**311.68**
Zone 2 - Silty Sand									
Cadmium	<0.29	<0.30	NS	NP	0.13	<0.29	0.25	8.12×10^{-2}	**0.50**
Lead	9.6	9.8	NS	NP	40	8.9	17.08	15.29	**62.95**
Zone 3 - Sand									
Cadmium	<0.29	<0.27	~~1.7~~	0.12	NS	<0.29	0.22	0.09	**0.49**
Lead	4.6	7.5	~~63~~	5.0	NS	5.0	5.42	1.38	**9.56**

Notes:
mg/kg = milligrams per Kilogram
background levels calculated as the mean concentration plus three standard deviations
NP = no samples collected because the lithologic zone was not present in the boring
NS = no samples collected
the analytical data for BG-3A will be used in place of data for BG-3 Zone 3
the analytical data for BG-3B will be used in place of data for BG-3 Zones 1 and 2

The laboratory reports and QA/QC data for the background soil samples are included in Appendix F. The background levels (CCLs) were calculated as the mean contaminant concentrations for the lithologic unit plus three standard deviations. The mean was calculated using the following equation:

$$\overline{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

The variance (s^2) was calculated using the following equation:

$$S^2 = \frac{\sum_{i=1}^{n} x_i^2 - \frac{\left(\sum_{i=1}^{n} x_i\right)^2}{n}}{n-1}$$

The standard deviation (S) is the positive square root of the variance (S^2). Therefore, (S) was calculated as follows:

$$(S) = \sqrt{S^2}$$

3.2.4 Clean Closure Limits

Based on the background levels determined for the site, the CCLs that were established for cadmium and lead in site soils are presented below in Table 5.

TABLE 5
Clean Closure Limits for Clay Liner and Soil

Lithologic Zone	Clean Closure Limit (mg/Kg)
Zone 1 - Fill Material	
cadmium	35.36
lead	311.68
Zone 2 - Silty Sand	
cadmium	0.50
lead	62.95
Zone 3 - Sand	
cadmium	0.49
lead	9.56

mg/Kg = milligrams per Kilogram

3.3 Waste Characterization

In order to determine if the ponds and drying areas contained wastes above the hazardous waste or IDEM Type II restricted waste thresholds, Dalton implemented a waste characterization program. The characterization involved collecting representative samples of sludge from each of the ponds and from each of the drying areas which contained waste at the time of the characterization program. These samples were submitted for TCLP cadmium and lead analysis. Prior to initiating the field sampling program, a 10 feet by 10 feet sampling grid was superimposed over each pond and drying area and sampling locations were identified at grid intersection locations selected using a random number generator. The number of samples identified for each unit (assuming the presence of waste in each unit) was the cube root of the total number of grid intersection points for each waste management unit. The identified sample locations are shown on Figure 5. Waste sampling was conducted in two phases, as described below, using the procedures described in the PSAP.

3.3.1 Initial Waste Characterization

In an October 25, 1995 letter, the IDEM requested that additional waste characterization be conducted at Pond 1 to further support limiting the target parameter list to only cadmium and lead. On November 3, 1995, waste samples were collected from the areas described in the October 25, 1995 IDEM letter. Waste samples 1WSS-1 and 1WSS-2 were collected from the 1-W Drying Area, waste samples 1ESS-1 and 1ESS-2 were collected from the 1-E Drying Area,

and waste samples 1PSS-1 and 1PSS-2 were collected from the Pond 1 sludge. The location of the samples are shown on Figure 6.

The samples were collected from the drying areas using a stainless steel bowl and spoon. The samples were collected from the pond using the on-site dredging equipment. All sampling and analysis were conducted in accordance with the procedures described in the PSAP. The samples were placed in appropriate, laboratory-cleaned sample containers and were placed in a cooler with ice immediately following sample collection. Chain-of-custody documentation was completed, and the samples were submitted to American Analytical, Inc. (A_2I) located in Merrillville, Indiana for analysis of TCLP volatile organic compounds (VOCs) by US EPA Method 8240, TCLP semivolatile organic compounds (SVOCs) by US EPA Method 8270, and TCLP RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver) by US EPA Method 6000/7000 series.

Laboratory results for the waste samples indicated that no constituents were detected above the hazardous or IDEM Type II restricted waste TCLP thresholds. No VOCs were detected above the laboratory quantitation limits. Cresol was detected in samples 1WSS-2, P1SS-1, and E1SS-1. Barium, cadmium, and lead were detected in most of the samples. A summary of detected constituents is provided below in Table 6. The laboratory reports and QA/QC data are included in Appendix G.

DALTON FOUNDRY BUILDING

LINDBERG STREET

HENDRICKS STREET

NORTH

UNPAVED ACCESS ROAD

POND #1

POND #2

POND #3

1-W

1-E

2-S

3-W

3-E

3-S

TRUCK SHOP

FENCE

CONRAIL RAILROAD LINE

LEGEND

SAMPLE LOCATION

1-E DRYING AREA DESIGNATION

O:DWGS/DALTON/FIG5a.DWG

REVISIONS			
NO.	DATE	DESCRIPTION	DRAWN BY
1	10/22/96	REVISED PER SPZ	DMM

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THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA

WASTE CHARACTIZATION SAMPLING LOCATIONS

PROJECT No.:	DATE:
95246.30	12/04/95
SCALE: 1" = 50'	DRAWN BY: HSW
FIGURE No.: 5	

DALTON FOUNDRY BUILDING

LINDBERG STREET

HENDRICKS STREET

NORTH

UNPAVED ACCESS ROAD

POND #1

POND #2

POND #3

1WSS-1

1WSS-2

1-W

1-E

2-S

3-W

3-E

3-S

TRUCK SHOP

FENCE

CONRAIL RAILROAD LINE

LEGEND

1-WSS-1 ■ INITIAL WASTE CHARACTERIZATION SAMPLE LOCATION AND DESIGNATION

I-E DRYING AREA DESIGNATION

O:DWGS/DALTON/DALTFIG5.DWG

REVISIONS			
NO.	DATE	DESCRIPTION	DRAWN BY
1	10/22/96	REVISED PER SPZ	DMM

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THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA

WASTE MANAGEMENT AREA
POND SAMPLING LOCATIONS

PROJECT No.:	DATE:
95246.30	10/25/96
SCALE: 1" = 50'	DRAWN BY: DMM
	FIGURE No.: 6

TABLE 6
Summary of TCLP Analytical Results for
Detected Chemical Constituents

Sample Designation	Chemical Constituent of Concern (reported in mg/L)				
	Barium	Cadmium	Lead	o-Cresol	p-Cresol
Hazardous Threshold	100	1	5	200	200
Type II Threshold	25	0.25	1.25	NA	NA
1WSS-1	0.81	0.028	0.21	<0.025	<0.025
1WSS-2	0.57	0.11	0.84	0.035	0.009J
1ESS-1	0.66	<0.01	0.29	0.043	<0.025
1ESS-2	0.53	<0.01	<0.05	<0.025	<0.025
1PSS-1	0.71	<0.01	0.082	0.032	<0.025
1PSS-2	0.53	<0.01	0.20	<0.025	<0.025

mg/L = milligrams per liter
J = estimated value. Detected below laboratory quantitation limit
NA = not applicable

Based on the results of the waste characterization sampling and analysis program described above, no chemical parameters were added to the target parameter list, and the remaining samples collected for waste characterization were analyzed for TCLP cadmium and lead only.

3.3.2 Final Waste Characterization

On June 6, 1996, August Mack mobilized to the site to collect sludge samples from each of the three Ponds for final waste characterization of the Pond waste at the pre-determined random sample locations indicated on Figure 7. Sludge samples from Ponds 1, 2 and 3 were collected using a stainless steel hand auger. Waste was not present in Drying Areas 2-S, 3-W, 3-E or 3-S. Therefore, no waste characterization was conducted for these areas. The bucket-type auger was advanced through the sludge in six-inch increments. The samples were placed in a stainless steel

bowl and mixed with a stainless steel trowel in order to form composite samples. The samples were then inspected and logged in the field notebook. After collection and logging, all sludge samples were placed in new, clean four-ounce glass containers equipped with Teflon lids. All samples were shipped to A_2I for TCLP cadmium and lead analysis.

Laboratory results indicated that all sludge samples collected from Pond 1 were below the hazardous waste characterization threshold and the Type II criteria for foundry waste characterization. However, samples P-2A and P-2B from Pond 2 and, samples P-3A, P-3E and P-3F collected from Pond 3 contained lead concentrations above the hazardous waste characterization threshold. The sampling locations and corresponding analytical results are shown on Figure 7. The laboratory report and QA/QC data is included in Appendix H.

Waste characterization samples collected from Ponds 2 and 3 exceeded the hazardous and/or IDEM Type II thresholds, therefore, stabilization of the waste in these areas was required prior to removal and disposal at the permitted Dalton monofill. As specified in the August 1995 Closure Plan, treatability studies were conducted to determine the reagent type and mixture ratio best suited to stabilize the waste so that lead did not leach at concentrations above the hazardous or Type II thresholds.

DALTON FOUNDRY BUILDING

LINDBERG STREET

HENDRICKS STREET

NORTH

UNPAVED ACCESS ROAD

POND #1

POND #2

Cd 0.18
Pb 0.41

D

Cd <0.01
Pb 1.2

C

B

Cd 0.12
Pb 11

A

Cd 0.10
Pb 16

1-W

A
B

1-E

2-S

Cd .041
Pb 0.43

Cd .040
Pb 0.39

POND #3

Cd <0.01
Pb 2.5

Cd <0.01
Pb 0.51

Cd <0.01
Pb 0.37

A

B

C

D

E

F

3-W

3-E

Cd <0.01
Pb 0.76

Cd <0.01
Pb 1.4

Cd <0.01
Pb 1.3

3-S

TRUCK SHOP

FENCE

CONRAIL RAILROAD LINE

LEGEND

A	SAMPLE LOCATION AND DESIGNATION
Cd 0.10 Pb 16	CADMIUM CONCENTRATION IN mg/Kg LEAD CONCENTRATION IN mg/Kg
1-E	DRYING AREA DESIGNATION

O:DWGS/DALTON/DALTALT6.DWG

REVISIONS

NO.	DATE	DESCRIPTION	DRAWN BY
1	10/22/96	REVISED PER SPZ	DMM
2	11/19/96	REVISED PER SPZ	DMM

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WARSAW, INDIANA

FINAL WASTE CHARACTERIZATION

PROJECT No.:	DATE:
95246.30	10/25/96
SCALE: 1" = 50'	DRAWN BY: DMM
	FIGURE No.: 7

3.3.3 Quality Assurance/Quality Control Summary for Waste Characterization Samples

On June 12, 1996, a total of 12 sludge samples were collected for TCLP cadmium and lead analysis. In accordance with field QA/QC requirements, two duplicate sludge samples were collected for TCLP cadmium and lead analysis, and one equipment blank sample was collected for analysis of total cadmium and lead. TCLP cadmium and lead analyses were conducted utilizing US EPA Methods 7131 and 7421, respectively. Total cadmium and lead analyses for the aqueous equipment blank were conducted using US EPA Method 6010.

The sludge samples were received at the laboratory on June 13, 1996, were digested on June 18, 1996, and were analyzed on June 20, 1996. All samples were analyzed within appropriate holding times. The quantitation limits for TCLP cadmium and lead ranged from 0.01 to 0.0025 mg/L and from 2.5 to 0.05 for lead. No cadmium or lead was detected in the equipment blank sample at detection limits of 0.01 and 0.05 mg/L, respectively. Based on the QA/QC review and reports, the data are valid and useable for quantitative purposes.

3.4 Treatability Studies

Following waste characterization, a treatability study was performed to identify the reagent best suited for stabilizing the cadmium and lead compounds in the sludge to render the material non-hazardous and below the Type II threshold prior to excavation and disposal. In addition, the optimum ratio of reagent to sludge was determined. The treatability study, therefore, consisted of

selecting reagents for treatability testing, mixing the reagents with raw sludge samples, analyzing the samples to assess reagent effectiveness, and selecting the best reagent and mix ratio for use at the site.

The characterization samples collected from locations P-2B and P-3A exhibited the highest concentrations of TCLP lead in Ponds 2 and 3, respectively. Thus, waste was collected from these two locations to use in the treatability studies to represent a "worst-case" scenario.

3.4.1 Reagent Identification

The potential reagents identified for treatability analysis were selected based upon conversations with reagent vendors and Dalton personnel. Because of Dalton's familiarity and success with a certain reagent (Enviro-Blend®) in their wastewater treatment plant (WWTP), this reagent was used to conduct the treatability studies. Enviro-Blend® is a stabilization reagent that is produced in two forms: Enviro-Phos® and Enviro-Mag®. Enviro-Phos® consists primarily of a special grade calcium phosphate. Enviro-Mag® consists of a special grade magnesium oxide manufactured for use in precipitation of heavy metals from solution. A mixture of the two reagents were chosen to chemically convert the metal compounds in the sludge into more stable, less leachable, metal species. Based on their experience in using these products related to treatment of the filtercake from the WWTP, Dalton proposed using a 50/50 mixture of these two products for the treatability studies. Material safety data sheets (MSDS) for the Enviro-Blend® products are provided in Appendix I.

3.4.2 Treatability Testing Procedures

Once the reagent was selected, test samples were prepared for analytical testing. The test samples, consisting of reagent/sludge mixtures, were prepared to assess sludge treatability through laboratory analysis. Volumes of reagent and waste were calculated and then weighed using a triple-beam scale. Once the materials were measured out, the samples were prepared by completely mixing the predetermined weight of sludge with the predetermined weight of reagent in a stainless steel pan, and transferring the mixture to a laboratory-clean glass sample container. The test samples mixture ratios varied from 0.05 parts of reagent per 1.0 part of sludge (0.05/1.0) to 0.15/1.0. Tables and calculations for the sample preparation are included in Appendix J.

The prepared samples were labeled and allowed to cure for 24 hours, and then were packed on ice and delivered with appropriate chain-of-custody documentation to A_2I for analysis. The laboratory testing program consisted of pH analysis (due to the alkaline nature of the solidification reagents) and TCLP cadmium and lead analysis.

3.4.3 Treatability Study Findings

The results of the TCLP analyses indicated that lead and cadmium were below detection at all mixture ratios which were tested (0.05/1.0 through 0.15/1.0). It was decided that instead of conducting additional studies to optimize and potentially lower the reagent/sludge mixture ratio, a

reagent/sludge mixture at a mixture ratio of 0.05/1.0 would be a conservative ratio to ensure adequate stabilization. The laboratory report and QA/QC data for the treatability study samples are provided in Appendix K.

3.5 Waste Stabilization, Excavation, and Disposal

3.5.1 Pond 1

On July 1, 1996, August Mack mobilized to the site to initiate excavation and disposal activities at Pond 1. As described in Section 3.4, waste characterization results for samples collected from Pond 1 were below the hazardous waste and Type II thresholds for foundry waste, therefore, no stabilization was required and the area was cleared for excavation and disposal. Sludge was excavated from Pond 1 using a John Deere Model 680B and a Caterpillar model 225 trackhoe excavator. Based on the high liquid content of the sludge, foundry sand destined for disposal at the monofill under Dalton's existing permit (Permit No. 43-6) was added to the sludge from Pond 1, as necessary, to adsorb free liquids prior to loading and transport.

Groundwater was encountered during excavation of sludge from Pond 1, at a depth of approximately 15 feet below grade. Groundwater encountered in the excavation was pumped, as practicable, into Pond 2 for temporary storage using a trash pump and hose. Excavation activities were continued until all of the visible sludge was removed and native material (brown sand) was

encountered at the base and sidewalls of Pond 1. Sludge removal activities for Pond 1 were completed on July 3, 1996. A total of 3,096 cubic yards of sludge were removed from Pond 1.

In order to reach the sludge near the base of the pond, drying areas 1-E and 1-W were removed. No waste was present in these drying areas at the time of their removal. A total of 692 cubic yards of material were removed from these drying areas.

3.5.2 Pond 2

On July 25, 1996, August Mack returned to the site to begin sludge stabilization and removal from Pond 2. Prior to stabilizing the waste, surface water present in Pond 2 was pumped into Pond 3. Following the removal of surface water, stabilization activities were commenced.

As described in Section 3.4.2, selected waste samples collected from the southeast portion of Pond 2 exceeded the hazardous and/or Type II thresholds. Therefore, the waste in these areas was stabilized with reagent prior to excavation, transport and disposal.

In order to apply the reagent, a section of the pond was measured and designated as the application zone. The application zone for Pond 2 is shown in Figure 8. The application zones typically measured approximately 20 feet square. The weight of raw sludge in the application zone was determined by calculating the volume of sludge present in the zone and multiplying this value by the raw sludge density. Previous testing by Dalton personnel indicated that the raw

sludge had a density of approximately 110 pounds per cubit foot (lbs/ft^3). This data was then used to determine the amount of reagent required to stabilize the sludge utilizing the weight-based 0.05/1.0 reagent usage ratio.

The reagent was applied by first connecting one reagent container to the bucket of the excavator via a chain and steel hanger assembly. A prefabricated opening on the bottom of each container was opened and the container was then elevated over the application zone. Once elevated, the reagent was able to flow through the opening onto the application zone. Following the addition of reagent, the container and hanger assembly were removed from the excavator. The excavator bucket was equipped with teeth that were used to rake across the application zone to agitate the mixture and to work the reagent into the sludge. This raking and mixing was performed to obtain a uniform mixture. The mixing activities were continued in place until the entire application zone exhibited a homogenous color and texture. A total of 4 tons of reagent were used to stabilize the sludge in Pond 2.

After mixing, the material was allowed to cure for a period of 24 hours. Samples of the stabilized waste were collected for stabilization verification analyses at a rate of one sample for each 200 cubic yard volume of waste type generated. As each 200 cubic yards volume of sludge was stabilized, one composite sample was collected from the application zone. The composite sample consisted of several sludge samples being collected from the application zone and being mixed in a stainless steel bowl prior to placing the sample into a container. The sample was submitted to A_2I for TCLP cadmium and lead analysis to verify the effectiveness of the

stabilization. Laboratory analysis revealed that the concentrations of lead and cadmium were below the IDEM Type II criteria for foundry waste. The laboratory report and QA/QC data is included in Appendix L. In addition, three composite waste samples (P-2N, P-2M, and P-2S) were collected outside of the boundaries of the stabilization area to confirm that no waste remained in the remainder of the pond above the hazardous or Type II restricted waste thresholds. The samples were submitted to A_2I for TCLP analysis of cadmium and lead. The analytical results indicated that the waste in these areas was below the applicable thresholds. The laboratory report and QA/QC data for these samples is included in Appendix M.

On August 5, 1996, August Mack re-mobilized to the site to begin removal of the stabilized sludge from Pond 2. Since the sludge in Pond 2 also had a high liquid content, foundry sand was added as necessary to adsorb free liquids. Groundwater was encountered during sludge excavation at a depth of approximately 15 ft bg. The encountered groundwater was pumped to Pond 3 via the existing concrete piping. Sludge excavation activities proceeded until all visible signs of sludge were removed and native material (brown sand) was encountered at the base and sidewalls of Pond 2. Sludge removal activities for Pond 2 were completed on August 7, 1996. A total of 1,620 cubic yards of sludge were removed from Pond 2.

3.5.3 Pond 3

On August 24, 1996, August Mack returned to the site to begin sludge stabilization and removal from Pond 3. Prior to stabilizing and removing the waste, accumulated surface water in Pond 3

was transferred to Dalton's wastewater treatment system Following the removal of the surface water, the sludge was stabilized.

As described in Section 3.3.2, selected waste samples collected from portions of Pond 3 exceeded the hazardous and/or Type II thresholds. Therefore, the waste in these areas were stabilized prior to excavation, transport, and disposal. Three application zones were established in Pond 3 (see Figure 8). Reagent was applied to the applications zones using the same methods discussed in Section 3.5.2.. A total of 6 tons of reagent were used to stabilize approximately 100 tons of the sludge in Pond 3.

After allowing the stabilized sludge to cure for 24 hours, the following samples were collected for stabilization verification analyses from each of the three stabilized areas and surrounding boundaries of the stabilized areas (see Figure 8).

Application Area 1: P3-1, P3-1N, P3-1S, P3-1E, P3-1W
Application Area 2: P3-2, P3-2N, P3-2S, P3-2W
Application Area 3: P3-3, P3-3N, P3-3S, P3-3E, P3-3W

The samples were submitted to A2I for TCLP analysis of cadmium and lead. Laboratory analysis revealed that all of the samples collected from Pond 3 were below the Type II criteria for disposal at Dalton's Monofill. The laboratory report and QA/QC data are included in Appendix N.

On August 28, 1996, sludge removal activities for Pond 3 were initiated. Foundry sand was once again used to aid in adsorbing free liquids in the sludge prior to loading and transport. During excavation activities, groundwater was encountered and was pumped to Dalton's wastewater treatment system via the existing PVC piping for use as make-up water prior to discharge to the City of Warsaw's sewage treatment system.

Waste removal activities were completed on September 4, 1996. Approximately 2,560 cubic yards of sludge were removed from Pond 3. Prior to backfilling Pond 3, the concrete gravity-feed pipeline connecting Pond 2 and Pond 3 was triple rinsed in accordance with the February 6, 1996 IDEM approval letter. In addition, the concrete sidewalls of Pond 3 were pressure washed. The rinse water generated during the decontamination activities was collected and disposed in Dalton's wastewater treatment system.

3.5.4 Summary of Waste Stabilization, Excavation and Disposal Activities

During closure of Ponds 1, 2 and 3 a total of approximately 7,276 cubic yards of sludge was removed. Of that total, approximately 300 cubic yards of sludge was stabilized and solidified, requiring the use of 10 tons of reagent. Approximately 540 cubic yards of foundry sand was used to adsorb free liquids prior to transport. The volumes of sludge, reagent and stabilized material associated with each individual Pond are summarized below in Table 7.

Table 7
Summary of Waste Volumes Removed from the Former Wastewater Ponds

Pond	Raw Sludge Volume	Reagent Used	Solidified Material Volume	Total Volume Removed
1	3,096 yd^3	0	60 yd^3	3,156 yd^3
2	1,620 yd^3	4 tons	180 yd^3	1,806 yd^3
3	2,560 yd^3	6 tons	300 yd^3	2,862 yd^3

yd^3 = cubic yards

The final dimensions of the pond excavations areas were as follows:

Pond 1= 90 feet long by 50 feet wide by 15 feet deep
Pond 2 = 130 feet long by 40 feet wide by 15 feet deep
Pond 3 = 140 feet long by 100 feet wide by 15 feet deep

3.5.5 Sludge Drying Areas

In addition, no waste sludge was present in the drying areas at the time of closure (July 1, 1996). Therefore, no additional waste characterization or removal activities were conducted in the drying areas. As previously described, sludge was present in the drying areas for Pond 1 (1-E and 1-W) during the initial waste characterization program (November 3, 1996) described in Section 3.3.1. This material did not exceed the thresholds for hazardous or IDEM Type II restricted waste, therefore, it was removed and disposed of a the Dalton monofill as part of the final pond dredging activities prior to closure.

3.6 Residual Liner/Underlying Soil Characterization

3.6.1 Wastewater Ponds

Since all soil and liner material beneath the ponds were removed down to the water table during the waste removal activities described above, characterization sampling of the residual liner and/or underlying soils in the pond areas was not possible.

3.6.2 Sludge Drying Areas

Soils in the drying areas were characterized by collecting soil samples at randomly-selected locations using the grid procedures described in the Closure Plan. Initially, soil borings at each of the pre-determined sample locations were drilled to five feet below grade or until the water table was encountered, whichever occurred first. Soil samples were collected continuously from the borings in one-foot depth increments to the total depth of the boring using the soil sampling procedures in the PSAP. Each sample was lithologically described, and the lithologic zone (Zone 1, 2 or 3) was determined.

A portion of each sample was placed in a stainless steel bowl and mixed with a stainless steel trowel in order to form a composite sample. The samples were labeled and logged in the field notebook. After collection and logging, all soil samples were placed in new, clean four ounce

glass containers equipped with Teflon lids. All samples were shipped to A_2I with chain-of-custody documentation for analysis of total cadmium and lead.

The sampling results were then correlated with the appropriate lithologic description and compared to the CCLs established for this project. Based on the lithologies encountered, all soil samples collected from the drying areas consisted of foundry sand fill, and thus utilized the CCLs established for Zone 1 as the basis for comparison. The samples were analyzed from the top-down for total lead and cadmium until two consecutive samples met the CCLs. The randomly selected sample locations and their respective laboratory results are shown on Figure 9.

3.6.2.1 Drying Areas 1-W and 1-E

As previously mentioned, Drying Areas 1-E and 1-W and underlying soils were excavated during sludge removal activities at Pond 1 to facilitate access to the pond. On July 10 and 11, 1996, soil samples were collected from the base of the 1-E and 1-W excavations for analysis of total cadmium and lead. Laboratory analysis results indicated that the concentrations of cadmium and lead were below the CCLs. The laboratory report and QA/QC data for these samples is included in Appendix O.

DALTON FOUNDRY BUILDING

LINDBERG STREET

HENDRICKS STREET

NORTH

UNPAVED ACCESS ROAD

POND #1

POND #2

POND #3

1-W

1-E

2-S

3-W

3-E

3-S

1-WA		
0-1	Cd	<1.6
	Pb	44
1-2	Cd	<1.7
	Pb	46

1-WB		
0-1	Cd	<1.7
	Pb	34
1-2	Cd	<1.5
	Pb	19

1-WC		
0-1	Cd	<1.5
	Pb	35
1-2	Cd	<1.5
	PB	22

1-EC		
0-1	Cd	<1.6
	Pb	51
1-2	Cd	<1.5
	Pb	48

1-EB		
0-1	Cd	<1.6
	Pb	31
1-2	Cd	<1.6
	Pb	33

1-EA		
0-1	Cd	<1.6
	Pb	42
1-2	Cd	<1.6
	Pb	22

2-SA		
0-1	Cd	22
	Pb	780
1-2	Cd	25
	Pb	3,000
2-3	Cd	13
	Pb	930
3-4	Cd	<3.3
	Pb	230
4-5	Cd	5.3
	Pb	408

2-SB		
0-1	Cd	24
	Pb	640
1-2	Cd	8.7
	Pb	210

2-SC		
0-1	Cd	2.0
	Pb	100
1-2	Cd	12
	Pb	440
2-3	Cd	8.9
	Pb	290

2-SD		
0-1	Cd	16
	Pb	440
1-2	Cd	<1.7
	Pb	180

3-WA		
0-1	Cd	10
	Pb	320
1-2	Cd	<1.6
	Pb	110

3-WB		
0-1	Cd	9.2
	Pb	330
1-2	Cd	5.7
	Pb	170

3-WC		
0-1	Cd	10
	Pb	340
1-2	Cd	17
	Pb	520
2-3	Cd	<2.3
	Pb	25

3-EC		
0-1	CD	<1.5
	PB	40
1-2	CD	<1.6
	PB	25

3-EA		
0-1	CD	3.3
	PB	53
1-2	CD	<1.6
	PB	52

3-EB		
0-1	CD	<1.5
	PB	290
1-2	CD	<1.6
	PB	76

3-SA		
0-1	Cd	9.6
	Pb	370
1-2	Cd	2.2
	Pb	64

3-SB		
0-1	Cd	11
	Pb	410
1-2	Cd	<1.5
	Pb	12

3-SC		
0-1	Cd	<1.7
	Pb	46
1-2	Cd	1.6
	Pb	46

3-SD		
0-1	Cd	<1.6
	Pb	70
1-2	Cd	<1.5
	Pb	16

TRUCK SHOP

FENCE

CONRAIL RAILROAD LINE

LEGEND

■	SAMPLE LOCATION
1-WC	SAMPLE LOCATION
Cd <1.6 Pb 22	CADMIUM CONCENTRATION IN mg/KG LEAD CONCENTRATIN IN mg/Kg
0-1	SAMPLE INTERVAL DEPTH (FT)
I-E	DRYING AREA DESIGNATION

O:DWGS/DALTON/DALTALT4.DWG

REVISIONS

NO.	DATE	DESCRIPTION	DRAWN BY
1	10/22/96	REVISED PER SPZ	DMM

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THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA

SLUDGE DRYING AREAS
SAMPLING LOCATIONS

PROJECT No.: 95246.30
DATE: 10/25/96
SCALE: 1" = 50'
DRAWN BY: DMM
FIGURE No.: 9

3.6.2.2 Drying Area 2-S

On July 10 and 11, 1996, soil borings were drilled and soil samples were collected from four pre-determined sampling locations at Drying Area 2-S: 2-SA, 2-SB, 2-SC, and 2-SD (see Figure 9). All of the samples collected were detected at levels below the CCL with the exception of samples collected from boring 2-SA. Soil samples collected from boring 2-SA revealed lead concentrations above the CCLs at a depth of five feet below grade. The laboratory report and QA/QC data are included in Appendix O.

Since the lateral and vertical extent of soil impacts above CCLs was not defined by the initial sampling efforts, on July 24, 1996, a deeper soil boring was drilled at boring location 2-SA, and additional soil borings were drilled to define the lateral extent of impacts above the CCLs. The borings were placed laterally along the ordinal directions around the location which exceeded the CCLs (2-SA). The first adjacent borings, 2-SA-1 and 2-SA-2, were placed in the adjacent grid intervals (10 feet from the original boring). The laboratory reports and QA/QC data are contained in Appendix P. Sample locations and corresponding analytical results are shown on Figure 10.

DALTON FOUNDRY BUILDING

LINDBERG STREET

HENDRICKS STREET

NORTH

UNPAVED ACCESS ROAD

POND #1

POND #2

POND #3

1-W

1-E

2-S

3-W

3-E

3-S

TRUCK SHOP

2-SA-2A	
0-1	Cd 3.3 Pb 470
1-2	Cd <2.9 Pb 850
2-3	Cd <2.9 Pb 72

2-SA-1	
0-1	Cd <1.9 Pb 27
1-2	Cd 7.8 Pb 350
2-3	Cd 6.2 Pb 340
3-4	Cd <2.6 Pb 140
4-5	Cd <9.5 Pb 1,800
5-6	Cd <2.7 Pb 27
6-7	Cd <1.9 Pb 19

2-SA-2	
0-1	Cd 5.4 Pb 210
1-2	Cd <2.5 Pb 91
2-3	Cd 37 Pb 1,100
3-4	Cd <2.6 Pb 140
4-5	Cd 4.6 Pb 210
5-6	Cd <1.5 Pb <14
6-7	Cd <2.4 Pb 12

2-SA-1A	
0-1	Cd 26 Pb 1,200
1-2	Cd 4.7 Pb 370
2-3	Cd 6.0 Pb 680
3-4	Cd 13 Pb 480
4-5	Cd <2.9 Pb 100

3-WC-2A	
0-1	Cd 5.1 Pb 340
1-2	Cd 7.6 Pb 340

3-WC-1A	
0-1	Cd <2.8 Pb 97
1-2	Cd 13 Pb 480

3-WC-1	
0-1	Cd 4.7 Pb 280
1-2	Cd <17 Pb 430
2-3	Cd <19 Pb 690
3-4	Cd <19 Pb 760
4-5	Cd 13 Pb 610
5-6	Cd <3.4 Pb 130
6-7	Cd <7.8 Pb 69

3-WC-2	
0-1	Cd 7.9 Pb 300
1-2	Cd <18 Pb 380
2-3	Cd 14 Pb 540
3-4	Cd <19 Pb 610
4-5	Cd <10 Pb <50
5-6	Cd <8.1 Pb 52
6-7	Cd <3.2 Pb 58

3-WC-3A	
0-1	Cd 24 Pb 780
1-2	Cd 8.0 Pb 314

3-WC-3	
0-1	Cd 4.0 Pb 210
1-2	Cd 24 Pb 880
2-3	Cd 10 Pb 550
3-4	Cd <8.6 Pb 440
4-5	Cd <9.5 Pb 370
5-6	Cd <8.9 Pb 49
6-7	Cd <8.8 Pb 89

CONRAIL RAILROAD LINE

FENCE

LEGEND

2-SA-2	SAMPLE LOCATION
Cd 5.4 Pb 210	CADMIUM CONCENTRATION IN mg/Kg LEAD CONCENTRATION IN mg/Kg
0-1	SAMPLE INTERVAL DEPTH (FT)
I-E	DRYING AREA DESIGNATION

O:DWGS/DALTON/FIG4x.DWG

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EXPANDED DRYING AREA INVESTIGATION
SAMPLING LOCATIONS AND RESULTS

PROJECT No.:	DATE:
95246.30	10/25/96
SCALE: 1" = 50'	DRAWN BY: DMM
FIGURE No.: 10	

Since samples from both of these locations also exceeded the CCLs, on August 15, 1996, soil borings, 2-SA-1A and 2-SA-2A, were placed two grid intervals away from the adjacent boring (30 feet from the original boring) and soil samples were collected for analysis of total cadmium and lead. Soil samples collected from these borings also contained lead levels above the CCLs. Thus, the extent of impacts above the CCLs still was not determined for drying area 2-S. The laboratory reports and QA/QC data are contained in Appendix Q. Sample locations and corresponding analytical results are shown on Figure 10.

3.6.2.3 Drying Areas 3-E, 3-S, and 3-W

As determined in the approved closure plan, three randomly-selected borings were placed in both drying areas 3-E and 3-W, and four sample locations were established for drying area 3-S. On July 10 and 11, 1996, soil borings were drilled at these locations and soil samples were collected and submitted for analysis of total cadmium and lead. All of the samples collected from drying area 3-E were below the CCL. For drying area 3-S, the soil sample collected at the zero to one ft depth interval exceeded the CCL, and no other samples exceeded the CCLs. Drying area 3-W contained one sampling location, 3-WC, which was above the CCLs to the depth explored (approximately eight feet). The laboratory report and QA/QC data are included in Appendix O. Sample locations and corresponding analytical results are shown on Figure 9.

Since the extent of impacts in the area of 3-WC was not defined, on July 24, 1996, borings 3WC-1 and 3WC-2, and 3WC-3 were placed adjacent to the boring location at the next ordinal grid

location and soil samples were collected for analysis of total cadmium and lead. Selected samples collected from borings 3WC-1, 3WC-2 and 3WC-3 were also above the established CCLs. The laboratory reports and QA/QC data are contained in Appendix P. Sample locations and corresponding analytical results are shown on Figure 10.

Since selected samples from these locations also exceeded the CCLs, on August 15, 1996, borings, 3W-1A and 3W-2A, and 3W-3A were placed two grid intervals away from the adjacent borings (30 feet from the original boring) and soil samples were collected for analysis of total cadmium and lead. Selected soil samples collected from the borings described above also contained lead levels above the CCLs. Therefore, the extent of impacts near drying area 3-W was not determined. The laboratory report and QA/QC data are included in Appendix Q. Sample locations and corresponding analytical results are shown on Figure 10.

3.6.2.4 Alternate Sampling Plan Near Drying Areas 2-S and 3-W

Because the lateral and vertical extent of lead impacts above the CCLs at drying areas 2-S and 3-W was not defined by the sampling efforts described above, August Mack designed an alternate sampling plan to maximize coverage so that the extent of impacts could be defined in one final sampling event. This plan consisted of 15 borings that covered the entire area around drying areas 2-S and 3-W.

On September 16, 1996, August Mack returned to the site to initiate the alternate sampling plan. A total of 15 borings (B-2 through B-16) were placed around drying areas 2-S and 3-W. The borings were drilled to a average depth of eight feet bg or until groundwater was encountered using the hollow-stem auger drilling method. The field methods for these drilling activities were performed in accordance with the procedures described in the PSAP. The samples were collected in one-foot intervals using a split spoon sampler, logged in a field notebook and placed in new, clean 4-ounce sample containers and submitted to A_2I for analysis of total cadmium and lead. The boring locations and their respective laboratory results are graphically represented on Figure 11.

Implementation of this sampling event was successful in defining the horizontal extent of lead impacts in unsaturated soils above the established CCLs. All of the samples collected from the 15 borings were below the CCLs for cadmium. Samples collected from borings B-2, B-3, B-10, B-11 and B-16 contained lead concentrations above the CCLs for lead at depths ranging from 0 to 2 feet bg, however; deeper impacts were not identified at concentrations above the CCLs. The laboratory report and QA/QC data are contained in Appendix R. As mentioned above, the analytical results are presented graphically on Figure 11.

3.6.2.5 Disposal Characterization for Drying Area Soils to be Excavated

Upon completion of the characterization investigation for the extent of unsaturated soils impacted with lead and cadmium above the CCLs, composite samples were prepared by A_2I for

DALTON FOUNDRY BUILDING

LINDBERG STREET

HENDRICKS STREET

NORTH

B-4		
0-1	Cd 3.0	Pb 85
1-2	Cd 5.5	PB 230

B-2		
0-1	Cd 4.1	Pb 580
1-2	Cd 0.39	Pb 20
2-3	Cd 0.18	Pb 8.3

B-3		
0-1	Cd 6.0	Pb 210
1-2	Cd 13	Pb 3,600
2-3	Cd 4.0	Pb 8.4
3-4	Cd 1.4	Pb 19

B-5		
0-1	Cd 9.0	Pb 370
1-2	Cd 55	Pb 170
2-3	Cd 0.084	Pb 4.9

B-6		
0-1	Cd 0.41	Pb 12
1-2	Cd 0.30	Pb 13

B-8		
0-1	Cd 5.0	Pb 180
1-2	Cd 8.6	Pb 280

B-7		
0-1	Cd 2.7	Pb 39
1-2	Cd 0.21	Pb 65

B-10		
0-1	Cd 1.3	Pb 160
1-2	Cd 4.1	Pb 2,200
2-3	Cd 0.78	Pb 31
3-4	Cd 0.44	Pb 34

B-11		
0-1	Cd 5.3	Pb 150
1-2	Cd 13	Pb 440
2-3	Cd 2.5	Pb 34
3-4	Cd 3.0	Pb 110

B-12		
0-1	Cd 9.7	Pb 240
1-2	Cd 9.6	Pb 260

B-9		
0-1	Cd 0.22	Pb 7.1
1-2	Cd 0.24	Pb 8.6

B-13		
0-1	Cd 0.26	Pb 9.6
1-2	Cd 0.30	Pb 16

B-14		
0-1	Cd 0.45	Pb 33
1-2	Cd 0.45	Pb 100

B-15		
0-1	Cd 1.8	Pb 190
1-2	Cd 8.5	Pb 200

B-16		
0-1	Cd 7.9	Pb 520
1-2	Cd 2.5	Pb 41
2-3	Cd 4.3	Pb 40

B-2 B-3 B-4 B-5 B-6 B-7 B-8 B-9 B-10 B-11 B-12 B-13 B-14 B-15 B-16

UNPAVED ACCESS ROAD

POND #1 POND #2 POND #3

1-W 1-E 2-S 3-W 3-E 3-S

TRUCK SHOP

FENCE

CONRAIL RAILROAD LINE

LEGEND

- SAMPLE LOCATION
- B-7 SOIL BORING LOCATION
- Cd 0.24 / Pb 8.6 CADMIUM / LEAD CONCENTRATION IN mg/Kg
- 0-1 SAMPLE INTERVAL DEPTH (FT)
- 1-E DRYING AREA DESIGNATION

O:DWGS/DALTON/DALTALT3.DWG

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ALTERNATE SAMPLING PLAN
BORING LOCATIONS AND RESULTS

PROJECT No.:	DATE:
95246.30	10/25/96
SCALE: 1" = 50'	DRAWN BY: DMM
	FIGURE No.: 11

disposal characterization. For Drying Area 2-S, aliquots of collected samples that exceeded the CCLs were composited into one sample and analyzed for TCLP lead. Cadmium thresholds were not exceeded, therefore analysis was not conducted for cadmium. This procedure was repeated for soils associated with Drying Area 3-W. The sample results indicated that the soils were below the hazardous and IDEM restricted waste Type II thresholds, and did not require stabilization prior to excavation and disposal. The laboratory reports and QA/QC data are included in Appendix S.

3.6.3 Quality Assurance/Quality Control Summary for Drying Area Characterization

July 10, 1996 Sampling Event

On July 10 and 11, 1996, a total of 45 soil samples were collected from 20 different locations at sludge drying areas 1-E, 1-W, 2-S, 3-E, 3-W, and 3-S. In accordance with field QA/QC requirements, ten duplicate soil samples (A through J) and five equipment blanks (A through E) were also collected.

All of the samples were analyzed for total cadmium and lead using US EPA Method 6010. The samples received on July 12, 1996, digested on July 14, 1996 through July 22, 1996 and analyzed on July 15 through July 17, 1996. All of the samples were analyzed within the appropriate holding times. The quantitation limit for total cadmium and lead ranged from 1.5 milligrams per Kilogram (mg/Kg) to3.9 mg/Kg and from7.4 mg/Kg and 19 mg/Kg, respectively. The quantitation limits for the equipment blanks were 0.010 and 0.050 mg/L for cadmium and lead, respectively. No cadmium

or lead were identified in the equipment blanks above the quantitation limits. Based on our review, the data are valid and considered to be quantitative.

July 24, 1996 Sampling Event

On July 24, 1996, additional characterization were collected for Drying Areas 2-S and 3-W. A total of 40 soil samples were collected for analysis of total cadmium and lead using US EPA Method 6010. The samples were received by the laboratory on July 25, 1996, digested on August 1, 1996 and analyzed on August 5, 1996 through August 9, 1996. All of the samples were analyzed within the appropriate holding times. The quantitation limit for total cadmium and lead ranged form 1.5 mg/Kg to 19 mg/Kg and 9.7 mg/Kg to 93 mg/Kg, respectively. Based on our review, the data are valid and considered to be quantitative.

August 15, 1996 Sampling Event

On August 15, 1996, a total of 12 additional soil samples were collected near Drying Areas 2-S and 3-W. All samples were submitted for analysis of total cadmium and lead by US EPA Method 6010. In accordance with the field QA/QC requirements, two duplicate samples and two field equipment blanks were also collected and analyzed for total cadmium and lead utilizing method number 6010.

The samples were received by the laboratory on August 16, 1996, digested in August 21, 1996, and analyzed on August 22, 1996. All samples were analyzed within the appropriate holding times. Quantitation limits ranged from 2.7 mg/Kg to 2.9 mg/Kg for cadmium and from 12 mg/Kg to 15

mg/Kg for lead. The quantitation limits for the equipment blanks were 0.010 and 0.050 mg/L for cadmium and lead, respectively. Based on our review, the data are valid and considered to be quantitative.

September 16 and 17, 1996 Sampling Event

On September 16 and 17, 1996, the final sampling event for Drying Areas 2-S and 3-W was conducted. A total of 15 soil borings were drilled and 114 soil samples were collected. Additionally, five duplicates and one equipment blank sample were collected. The soil and equipment blank samples were analyzed for total cadmium and lead utilizing US EPA Methods 7131 and 7421, respectively.

The samples were received by the laboratory on September 17, 1996, and analyzed between September 18 and 25, 1996. All of the samples were analyzed with the appropriate holding times. The quantitation limits for the soil samples ranged from 0.023 mg/Kg to 2.5 mg/Kg for cadmium and 0.40 mg/Kg to 450 mg/Kg for lead. The equipment blank quantitation limits for cadmium and lead were 0.025 and 0.005 mg/L, respectively. No cadmium or lead were identified in the equipment blanks above the quantitation limits. Based on our review, the data are valid and considered to be quantitative.

3.7 Residual Liner/Underlying Soil Excavation and Disposal

3.7.1 Sludge Drying Areas

The soil sampling programs described in Sections 3.6 were successful in delineating the lateral and vertical extent of soil impacted above the CCLs. The analytical results were reviewed, and the areas requiring excavation were determined. Efforts were made to be conservative in the designation of soils to be removed to ensure that the impacted soils above the CCLs were removed and disposed.

Once the areas requiring excavation were identified, August Mack returned to the site to begin excavation activities. The areas requiring excavation were determined based on the results of the liner/soil characterization program described in Section 3.7. The lateral and vertical extent of excavated soil is depicted on Figure 12. Excavation activities began on October 1, 1996, and were completed on October 4, 1996. The areas were restored by backfilling with clean fill on October 4, 1996. A total of 1,335 cubic yards of material was removed from drying areas 2-S and 3-W and the surrounding areas.

3.8 Site Restoration

3.8.1 Equipment Decontamination

Prior to initiating backfilling operations, all equipment involved in waste and soil removal activities was decontaminated. A decontamination pad was constructed near the southeast corner of Pond 3. The decontamination pad consisted of a small man-made containment area containing a small catch basin which was completely covered with visqueen. Gravel was placed over the visqueen in order to allow the decontamination waters to flow into the catch basin. The equipment was driven onto the decontamination pad where all gross waste was removed by shoveling/scraping and disposed of at Dalton's monofill. Following, the equipment was brushed and rinsed with a high-pressure hose. All decontaminate rinse water was collected, placed in 55-gallon drums and discharged into Dalton's wastewater treatment system.

3.8.2 Backfill Qualification Sampling and Analysis

Upon substantial completion of the waste and soil removal activities conducted for the ponds and sludge drying areas, site restoration activities were conducted. Restoration was initiated sequentially for each area as removal was completed. Site restoration involved bringing in clean fill from off-site to return the excavated areas to new grade.

Prior to backfilling, three soil samples were collected from random locations at a residential backfill pit located on the property of Mr. Raymond Haines in Warsaw, Indiana. Each sample was collected in a stainless steel bowl using a trowel to make composite samples from each location. The samples were placed in new, clean four-ounce glass containers equipped with Teflon lids and shipped to A_2I for total lead analysis. Analytical results for the samples indicated that the soil was below the CCLs for fill material and thus was cleared for backfill at the site. The laboratory report and QA/QC data is included in Appendix T.

3.8.3 Backfilling of Ponds and Excavated Areas

Backfilling of Pond 1 was completed on July 24, 1996. A total of 4,800 cubic yards of backfill material were utilized in backfilling Pond 1. On August 8, 1996, backfilling activities were conducted at Pond 2. Approximately 1,500 cubic yards of backfill were placed in the excavation for Pond 2. Backfilling operations were completed for Pond 3 on September 5, 1996, using approximately 400 cubic yards of backfill material. It should be noted that in order to utilize Pond 3 as a stormwater/make-up water retention pond, only one quarter of the total volume of Pond 3 was backfilled. Backfilling operations for the drying areas was completed on October 4, 1996. Approximately 6,700 cubic yards of clean material was used to backfill these areas. These areas are scheduled to be returned to useful service as a parking lot and laydown area.

4.0 GROUNDWATER DETECTION MONITORING PROGRAM

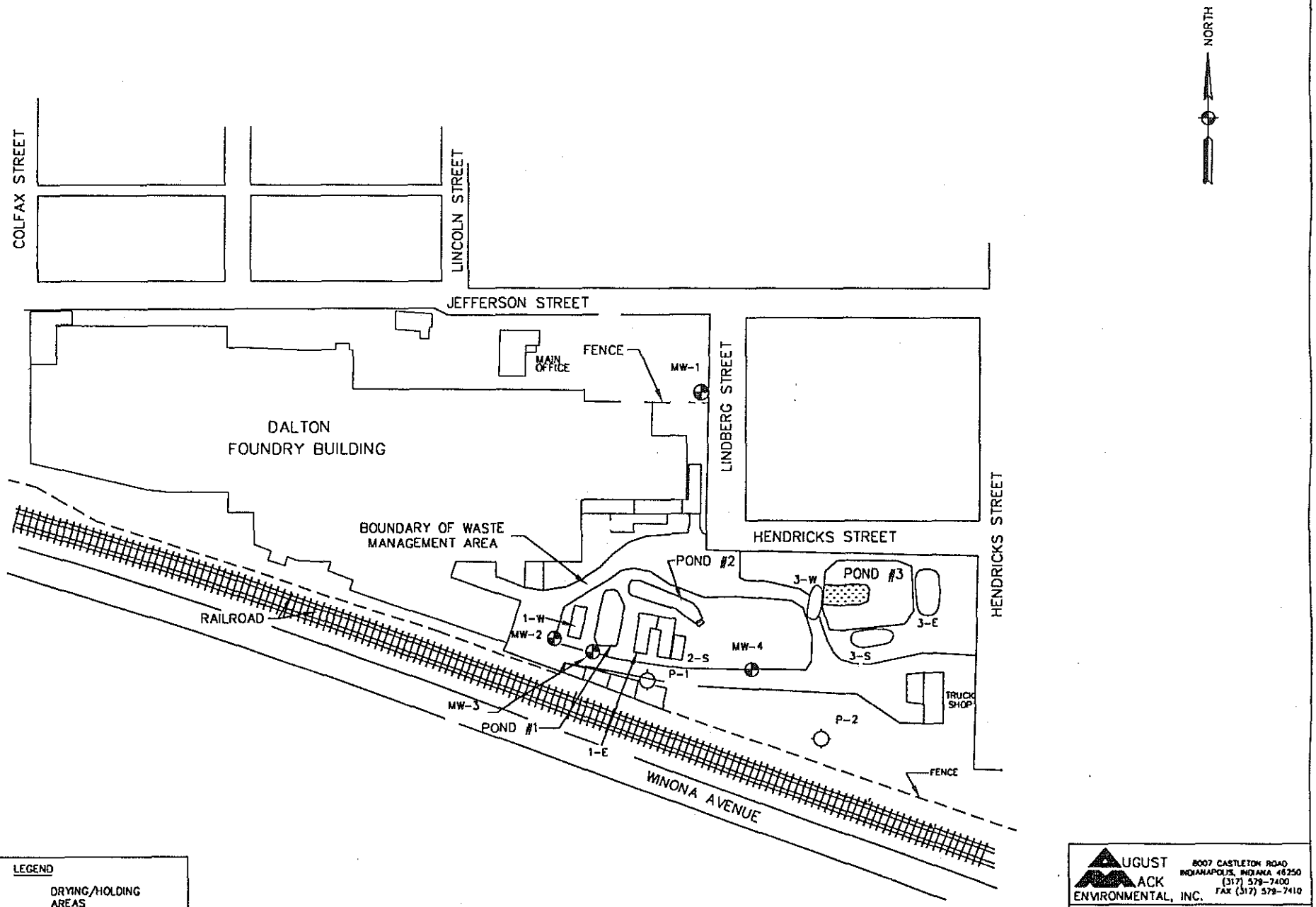
As part of the RCRA closure plan, Dalton developed a groundwater detection monitoring plan (DMP) designed to comply with the requirements of 329 IAC 3.1-9-1*(40 CFR 264, Subpart F)*. This program was developed and implemented to determine if constituents from the ponds or drying areas were present in groundwater at the downgradient limit of the waste management area (point of compliance) at statistically significant levels. As described in the DMP, Dalton implemented this program on an accelerated basis to expedite the closure schedule. All groundwater sampling activities were conducted in accordance with the procedures described in the DMP.

4.1 Monitor Well Installation

During site investigation activities conducted in 1993, three piezometers (P-1 through P-3) were installed at the site to aid in determining groundwater flow patterns in the shallow aquifer. Based on the water-level data obtained during this investigation, Piezometer P-3 was determined to be hydraulically upgradient of the ponds and drying areas. Therefore, as described in the closure plan, P-3 was converted into background monitor well MW-1 to use as the background monitoring point for the detection monitoring program. On September 27 through 28, 1995, Detection Monitor Wells MW-2, MW-3, and MW-4 were installed along the inferred

downgradient boundary of the waste management area (compliance point), as described in the August 1995 Closure Plan. The locations for the monitor wells are shown on Figure 13.

The wells were installed in accordance with the construction details and methodologies described in the August 1995 Detection Monitoring Plan (DMP) and in accordance with the procedures outlined in the US EPA guidance established in RCRA Ground-water Monitoring Technical Enforcement Guidance Document (TEGD)(1986) and RCRA Ground-Water Monitoring: Draft Technical Guidance Document (TGD)(1992). All drilling activities were observed and documented by an August Mack field geologist. The wells were developed by alternately surging and pumping until a relatively clear and sediment-free discharge was obtained. During development, approximately 130, 140 and 95 gallons were removed from Monitor Wells MW-2, MW-3 and MW-4, respectively. The borings logs and well construction diagrams are included in Appendix U. The wells were completed with flush-mounted manhole covers set in concrete over the wells. In addition, protective bumpers were placed around each well to prevent vehicular traffic from damaging the wells. Drill cuttings generated during monitor well installation were placed in the drying area adjacent to Pond 1, and were excavated along with the drying area material and disposed at Dalton's permitted monofill. Development water from the wells was placed in Pond 1.



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THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA

MONITORING WELL LOCATION MAP

PROJECT No.:	DATE:
95246.30	11/19/96
SCALE: 1"=200'	DRAWN BY: HSW
FIGURE No.: 13	

C:\DWGS\DALTON\95246.30\SITEA.DWG

4.2 Water-Level Measurements and Determination of Groundwater Flow Direction

After installation and development, the elevation of the top of the casing of each monitor well was surveyed by a registered land surveyor to the nearest 0.01 ft relative to the National Geodetic Vertical Datum of 1929 (NGVD). Each well was marked with an easily identifiable reference point from which water level measurements were performed.

Prior to conducting each groundwater sampling event, water levels were measured in the background Monitor Well MW-1, detection Monitor Wells MW-2 through MW-4, and Piezometers P-1 and P-2. Measurements were made to the nearest 0.01 foot using a battery-operated electronic water level measuring device. The water-level measurements are summarized in Table 8.

TABLE 8
WATER-LEVEL MEASUREMENTS

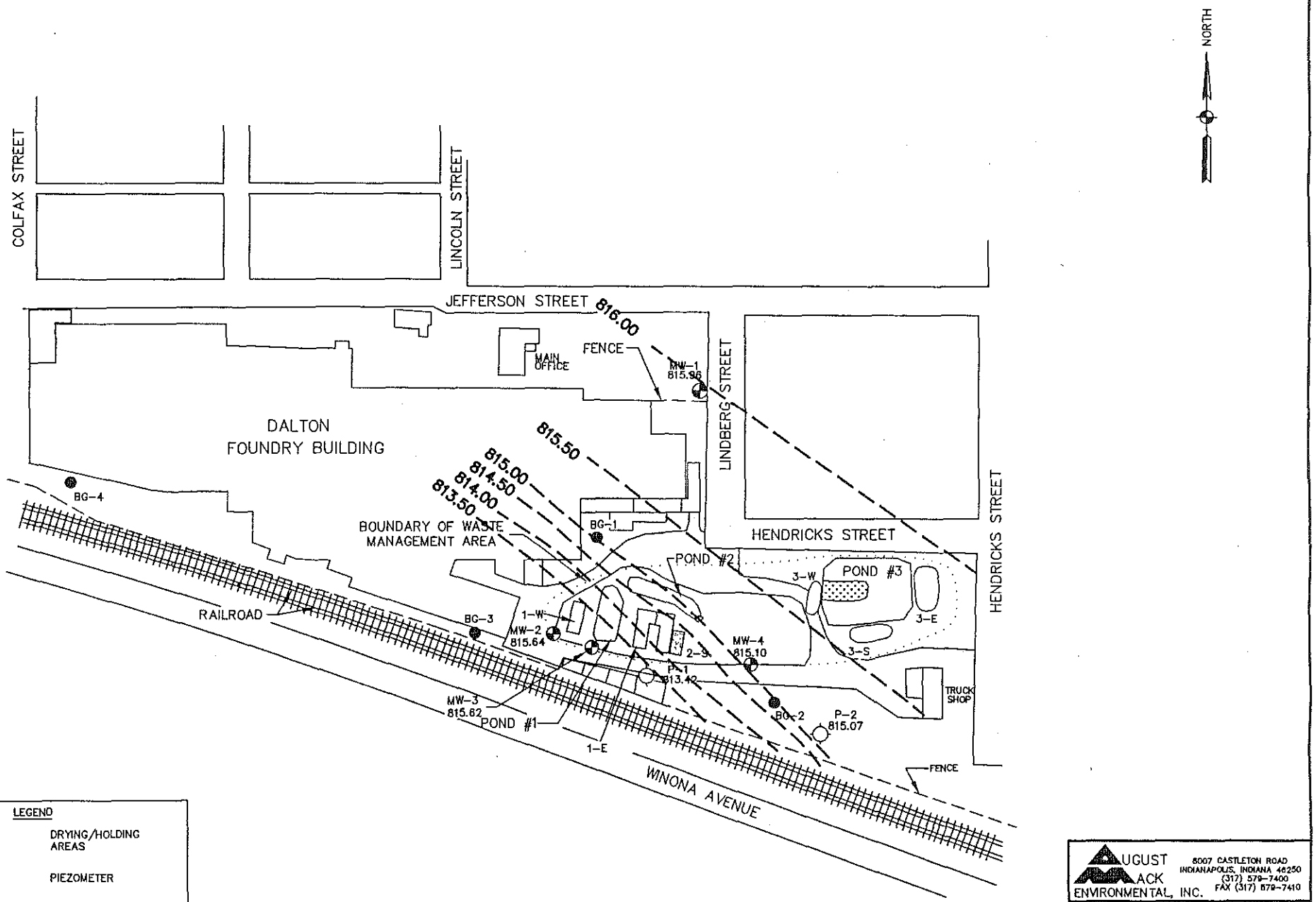
Monitor Well	Date Measured	Measuring Point[1] Elevation (feet MSL[2])	Depth-to-Water (feet btoc[3])	Water-Level Elevation (feet MSL)
MW-1	10/04/95	824.31	8.37	815.94
	11/09/95	824.31	8.15	816.16
	12/04/95	824.31	8.35	815.96
	01/08/96	824.31	8.73	815.58
	02/05/96	824.31	8.73	815.58
	03/06/96	824.31	8.94	815.37
	04/03/96	824.31	8.92	815.39
	05/02/96	824.31	8.48	815.83
	06/05/96	824.31	7.18	817.13
	07/10/96	824.31	7.45	816.86
	09/12/96	824.31	7.63	816.68
MW-2	10/04/95	826.04	10.38	815.66
	11/09/95	826.04	10.18	815.86
	12/04/95	826.04	10.40	815.64
	01/08/96	826.04	10.98	815.06
	02/05/96	826.04	10.73	815.31
	03/06/96	826.04	10.90	815.14
	04/03/96	826.04	10.90	815.14
	05/02/96	826.04	10.52	815.52
	06/05/96	826.04	9.34	816.70
	07/10/96	826.04	9.61	816.43
	09/12/96	826.04	9.78	816.26
MW-3	10/04/95	826.13	10.53	815.60
	11/09/95	826.13	10.30	815.83
	12/04/95	826.13	10.51	815.62
	01/08/96	826.13	10.91	815.22
	02/05/96	826.13	10.86	815.27
	03/06/96	826.13	11.06	815.07
	04/03/96	826.13	11.01	815.12
	05/02/96	826.13	10.64	815.49
	06/05/96	826.13	9.34	816.79
	07/10/96	826.13	9.78	816.35
	09/12/96	826.13	9.93	816.20
MW-4	10/04/95	823.13	8.05	815.08
	11/09/95	823.13	7.72	815.41
	12/04/95	823.13	8.03	815.10
	01/08/96	823.13	8.45	814.68
	02/05/96	823.13	8.36	814.77
	03/06/96	823.13	8.55	814.58
	04/03/96	823.13	8.46	814.67
	05/02/96	823.13	7.95	815.18
	06/05/96	823.13	9.47	813.66
	07/10/96	823.13	7.24	815.89
	09/12/96	823.13	7.49	815.64

Table 8. Continued

Monitor Well	Date Measured	Measuring Point[1/] Elevation (feet MSL[2/])	Depth-to-Water (feet btoc[3/])	Water-Level Elevation (feet MSL)
P-1	11/09/95	825.84	11.97	813.87
	12/04/95	825.84	12.42	813.42
	01/08/96	825.84	12.82	813.02
	02/05/96	825.84	12.77	813.07
	03/06/96	825.84	12.94	812.90
	04/03/96	825.84	12.92	812.88
	05/02/96	825.84	7.33	818.15
	06/05/96	825.84	11.20	814.64
	07/10/96	825.84	NA	NA
	09/12/96	825.84	NA	NA
P-2	11/09/95	823.04	7.56	815.48
	12/04/95	823.04	7.97	815.07
	01/08/96	823.04	NA	NA
	02/05/96	823.04	8.23	814.81
	03/06/96	823.04	8.45	814.59
	04/03/96	823.04	NA	NA
	05/02/96	823.04	12.40	810.64
	06/05/96	823.04	6.51	816.53
	07/10/96	823.04	NA	NA
	09/12/96	823.04	NA	NA

1/ Measuring Point = top of PVC well casing
2/ MSL = mean sea level
3/ BTOC = below top of PVC well casing

The measurements were used to construct water-level contour maps for the site and to determine groundwater flow patterns in the upper surficial aquifer. Selected groundwater elevation contour maps illustrating the groundwater flow direction at the site are shown in Figures 14 through 16. Based on the water-level information collected, groundwater flow in the shallow aquifer is toward the southeast. The water-level elevations for Monitor Wells MW-2 and MW-3 were consistently higher than what would be predicted when compared with the elevation data for other wells. This is interpreted to be the result of groundwater mounding that is manifested in these wells that were placed in close proximity to the ponds.



LEGEND

- 3-S — DRYING/HOLDING AREAS
- P-2 — PIEZOMETER
- MW-2 — MONITORING WELL
- 815.66 — WATER-LEVEL ELEVATION (FEET MSL)
- 815.66 — LINE OF EQUAL WATER-LEVEL ELEVATION (FEET MSL)

C:\DWGS\DALTON\95246.30\SITEx.DWG

REVISIONS			
NO.	DATE	DESCRIPTION	DRAWN BY

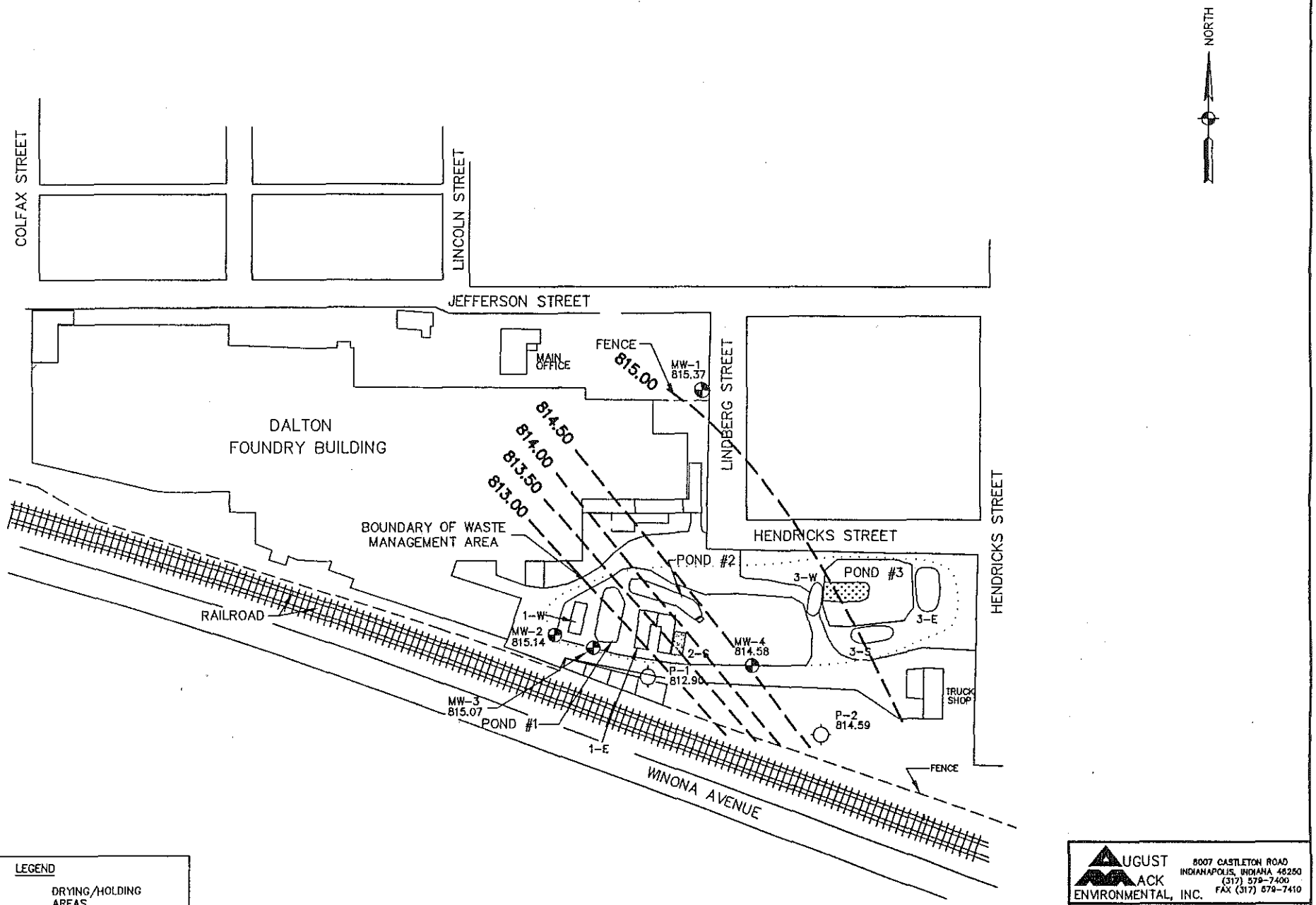
AUGUST MACK ENVIRONMENTAL, INC.
5007 CASTLETON ROAD
INDIANAPOLIS, INDIANA 46250
(317) 579-7400
FAX (317) 579-7410

THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA

GROUDWATER ELEVATION MAP
DECEMBER 4 1995

PROJECT No.:	DATE:
95253.30	11/02/95

SCALE:	DRAWN BY:	FIGURE No.:
1"=200'	HSW	14



LEGEND

- 3-S — DRYING/HOLDING AREAS
- P-2 — PIEZOMETER
- MW-2 — MONITORING WELL

REVISIONS			
NO.	DATE	DESCRIPTION	DRAWN BY

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THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA

GROUNDWATER ELEVATION MAP
MARCH 6, 1996

PROJECT No.:	DATE:
95246.30	11/19/96
SCALE: 1"=200'	DRAWN BY: HSW
	FIGURE No.: 15

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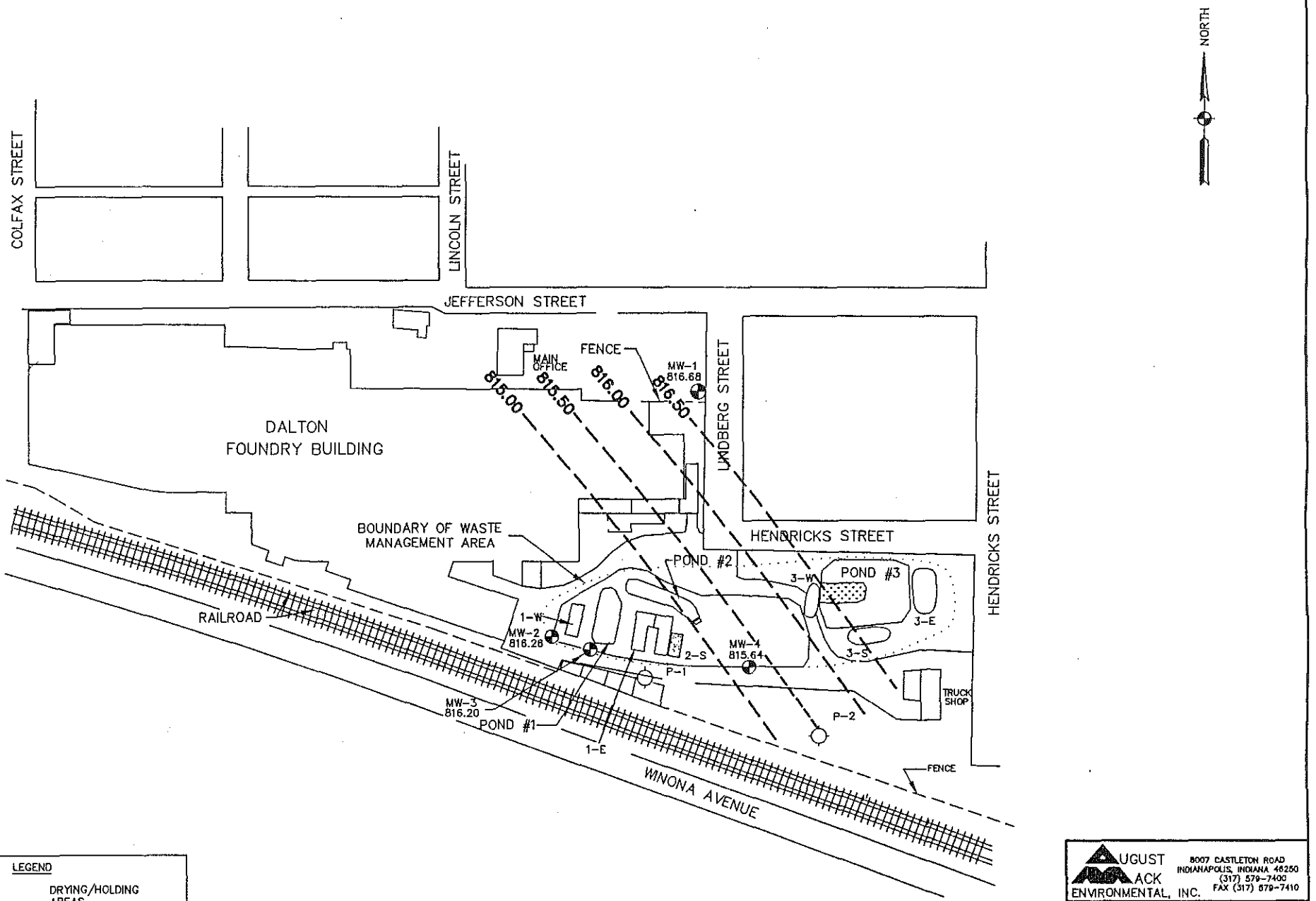

REVISIONS			
NO.	DATE	DESCRIPTION	DRAWN BY

AUGUST MACK ENVIRONMENTAL, INC.
8007 CASTLETON ROAD
INDIANAPOLIS, INDIANA 46250
(317) 579-7400
FAX (317) 579-7410

THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA

GROUNDWATER ELEVATION MAP
SEPTEMBER 12, 1996

PROJECT No.:	DATE:
95246.30	11/19/96
SCALE: 1"=200'	DRAWN BY: HSW
	FIGURE No.: 16

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4.3 Initial Appendix IX Groundwater Sampling and Analysis

The initial detection monitoring groundwater sampling event was conducted on October 4, 1995. As specified in the August 1995 closure plan, Groundwater samples were collected from background Monitor Well MW-1 and detection Monitor Wells MW-2 through MW-4 for analysis of the chemical constituents contained in 40 CFR 264, Appendix IX.

Groundwater sample collection involved water-level measurements, well evacuation, sample withdrawal, and equipment decontamination. The overall approach to conducting these activities is described in the DMP, and a detailed step by step procedure for each sampling task is provided in Appendix G of the DMP. Sample analyses were conducted in accordance with the procedures described in the QAPP. Field measurements of in-situ indicator parameters (pH, temperature and conductivity) were taken prior to purging, after each well volume has been removed (high yield wells), and after sampling was complete. Groundwater samples collected for analysis of metals were field-filtered using a 0.45 micron in-line filter.

Barium was detected in Monitor Wells MW-1 through MW-4. Bis (2-ethylhexyl) phthalate and sulfide were detected in Monitor Well MW-3 and vanadium was detected in Monitor Well MW-4. Bis (2-ethylhexyl) phthalate is a common laboratory artifact, and was not suspected to be a contaminant at the site. Therefore, only Monitor Well MW-3 was resampled for bis (2-ethylhexyl) phthalate during the second month to confirm its absence or presence. Cadmium, lead, barium, vanadium, and sulfide were established as the parameters of concern for the duration

of the detection monitoring program. The laboratory report and QA/QC data are included in Appendix V.

4.4 Monthly Detection Monitoring Program

On November 9, 1995, Month 2 of the Detection Monitoring Program was conducted. Sampling and analysis procedures were consistent with those described above. Groundwater samples were collected from background Monitor Well MW-1 and detection Monitor Wells MW-2 through MW-4, and submitted to A_2I for analysis of cadmium and lead (target parameters), and barium, vanadium and sulfide (detected in Appendix IX samples). Additionally, Monitor Well MW-3 was resampled for bis (2-ethylhexyl) phthalate to confirm its absence or presence, and was not detected. Barium was detected in Monitor Wells MW-1 through MW-4. Vanadium was detected in Monitor Wells MW-3 and MW-4. Sulfide was detected in Monitor Well MW-4. The laboratory report and QA/QC data are included in Appendix W.

On December 4, 1996 through March 6, 1996, Months 3 through 6 of the Detection Monitoring Program were conducted. Groundwater samples were collected from background Monitor Well MW-1 and detection Monitor Wells MW-2 through MW-4 and submitted to A_2I for analysis of barium, cadmium, lead, vanadium and sulfide. The laboratory report and QA/QC data are included in Appendix W. The data are summarized below in Table 9.

TABLE 9
SUMMARY OF ANALYTICAL RESULTS
FOR GROUNDWATER SAMPLES
COLLECTED FOR DETECTION MONITORING PROGRAM

Monitor Well	Sample Date	Barium	Cadmium	Lead	Vanadium	Sulfide
MW-1	10/04/94	0.023	<0.003	<0.005	<0.010	<0.050
	11/09/95	0.024	<0.003	<0.005	<0.010	<0.050
	12/04/96	0.022	<0.003	<0.005	<0.010	EHT
	01/08/96	0.023	<0.003	<0.005	<0.010	EHT
	02/05/96	0.017	<0.003	<0.005	<0.010	EHT
	03/06/96	0.021	<0.003	<0.005	0.020	<0.050
	04/03/96					<0.050
	05/02/96					<0.050
	07/10/96					<0.050
	09/10/96					<0.050
MW-2	10/04/95	0.080	<0.003	<0.005	<0.010	<0.050
	11/09/95	0.072	<0.003	<0.005	<0.010	<0.050
	12/04/96	0.087	<0.003	<0.005	<0.010	EHT
	01/08/96	0.093	<0.003	<0.005	<0.010	EHT
	02/05/96	0.078	<0.003	<0.005	<0.010	EHT
	03/06/96	0.063	<0.003	<0.005	<0.010	<0.050
	04/03/96					<0.050
	05/02/96					<0.050
	07/10/96					<0.050
	09/10/96					<0.050
MW-3	1/004/95	0.14	<0.003	<0.005	0.013	<0.050
	11/09/95	0.10	<0.003	<0.005	0.016	<0.050
	12/04/96	0.10	<0.003	<0.005	0.022	EHT
	01/08/96	0.13	<0.003	<0.005	0.023	EHT
	02/05/96	0.12	<0.003	<0.005	0.014	EHT
	03/06/96	0.14	<0.003	<0.005	0.024	<0.050
	04/03/96					<0.050
	05/02/96					<0.050
	07/10/96					<0.050
	09/10/96					<0.050
MW-4	10/04/95	0.37	<0.003	<0.005	<0.010	0.074
	11/09/95	0.36	<0.003	<0.005	0.011	0.106
	12/04/96	0.35	<0.003	<0.005	0.014	EHT
	01/08/96	0.38	<0.003	<0.005	0.013	EHT
	02/05/96	0.36	<0.003	<0.005	<0.010	EHT
	03/06/96	0.38	<0.003	<0.005	0.013	<0.050
	04/03/96					<0.050
	05/02/96					<0.050
	07/10/96					<0.050
	09/10/96					<0.050

EHT = sample exceeded holding time

4.5 QA/QC Review for Groundwater Data

Appendix IX Groundwater Sampling Event

The Appendix IX sampling event was conducted on October 4, 1996. Groundwater samples were collected from Monitor Wells MW-1 through MW-4. In accordance with field QA/QC requirements, one equipment blank sample was collected.

The samples were analyzed for the constituents contained in 40 CFR Part 264 Appendix IX. The samples received on October 5, 1995, and were analyzed within the appropriate holding times. No constituents were detected in the equipment blank sample, with the exception of bis (2-ethylhexyl) phthalate. This was not identified in any of the laboratory blanks or spikes. However, this contaminant was not interpreted to be related to contamination of the groundwater, rather a remnant of improper container cleaning or introduced at some step in the sample collection and/or analysis stage. Therefore, it was determined that Monitor Well MW-3 would be resampled for bis (2-ethylhexyl) phthalate during the second month of monitoring. Based on our review, the data are valid and considered to be quantitative.

Month 2 Groundwater Sampling Event

On November 9, 1995 the second month of detection monitoring was conducted. Groundwater samples were collected from Monitor Wells MW- 1 through MW-4 for analysis of cadmium, lead, barium, vanadium and sulfide. In accordance with field QA/QC requirements, one equipment blank sample was collected.

The samples were analyzed for the constituents described above. The samples received on November 13, 1995, and were analyzed within the appropriate holding times. Bis (2-ethylhexyl) phthalate was not confirmed in Monitor Well MW-3, and was interpreted to be artificially introduced. Therefore, this parameter was not analyzed for the remainder of the detection monitoring program. No constituents were detected in the equipment blank sample at concentrations above the laboratory quantitation limits. Based on our review, the data are valid and considered to be quantitative.

Months 3 through 6 Groundwater Sampling Event

On December 4, 1996 through March 6, 1996, Months 3 through 6 of the Detection Monitoring Program were conducted. Groundwater samples were collected from background Monitor Well MW-1 and detection Monitor Wells MW-2 through MW-4 for analysis of barium, cadmium, lead, vanadium and sulfide. In accordance with field QA/QC procedures, one equipment blank sample was collected during each monthly sampling event.

The samples were determined to be analyzed within appropriate holding times with the exception of sulfide. During data validation, it was determined that the sulfide analysis for months December, January and February were analyzed outside of the 7-day holding time. Therefore, the detection monitoring program was extended for the period from April through September 1996. Groundwater samples were collected monthly and submitted for analysis of sulfide. Table 9 presented above includes the laboratory results for the sulfide re-sampling. The laboratory reports and QA/QC data are included in Appendix X. Based on our review, the monthly data and sulfide re-sampling data are considered to be valid and quantitative.

4.5 Statistical Analysis for Groundwater Detection Monitoring Data

4.5.1 Statistical Analysis Procedures

The analytical results obtained from groundwater samples collected from detection monitoring wells were compared to the background values established by the sampling of MW-1 and to US EPA Action Levels and/or MCLs (0.005 mg/L for cadmium and 0.015 mg/L for lead). Assuming that the background monitoring reveals background values with coefficient's of variation of less than 1.00, the detection point well data will be compared to the background values using an analysis of variance (ANOVA).

An ANOVA compares the mean values of different groups of observations to determine if there is a significant difference among the groups. In this case, the background data was compared to

detection monitor well data. The ANOVA is considered to be especially useful where sample sizes are small, as in a detection monitoring program. At least four samples from at least three wells are needed to satisfy the sample size requirements for the ANOVA. A total of six samples were collected from each of one background (MW-1) and three detection monitoring wells (MW-2, MW-3 and MW-4) during background determination and detection monitoring.

The US EPA software package "A Ground Water Information Tracking System with Statistical Analysis Capability" (1992) (GRITS/STAT) was used for statistical analysis. GRITS/STAT is a comprehensive database system designed for data manipulation at RCRA and CERCLA sites. The GRITS/STAT software was used to compare detection monitor well data to background values using Cochran's Approximation to the Behrens-Fisher Students' T-Test, as described in 329 IAC 3.1-10-1(40 CFR 265, Appendix IV). This comparison was made for each well, and if the comparison indicated that the difference was significant, the sampling and comparisons procedures was repeated. If the second comparison revealed a significant difference then it was concluded that a statistically significant change had occurred.

The statistics were computed for several groups including:

- number of values below the detection limit,
- total number of values,
- mean,
- median
- standard deviation,
- coefficient of variation,
- maximum and minimum values.

The summary statistics provided a rapid means to detect errors in the data, evaluate contaminant concentrations over the entire groundwater monitoring system, and allow evaluation of spatial changes in contaminant concentrations. The summary tables are presented in Appendix Y.

4.5.2 Statistical Analysis Results

Statistical analysis of the groundwater data indicated that only barium was present in the groundwater at statistically significant levels. Cadmium and lead were not detected in any of the six monitoring events. Although vanadium and sulfide were detected, the statistical analysis determined that the levels were not significant. Print-outs for the statistical analysis conducted for each detection monitoring parameter are included in Appendix Y.

5.0 POST-CLOSURE CARE

Clean closure has been achieved for the former wastewater ponds and sludge drying areas at the Dalton facility. All waste was removed and transported off-site for disposal at Dalton's permitted monofill. All unsaturated soils identified above the CCLs also were removed and disposed at the monofill. Subsequently, the former ponds and drying areas were restored using clean fill, and the area was returned to active usage for storage and other operations. No post-closure care was required for these areas.

The groundwater detection monitoring program has been completed. The statistical analysis conducted for the groundwater data indicated that no cadmium or lead were present in the groundwater, and therefore are not statistically significant. Sulfide was not determined to be present at statistically significant levels in any of the monitor wells. Barium was determined to be present in compliance Monitor Wells MW-2, MW-3 and MW-4 at statistically significant levels. Vanadium was statistically significant for Monitor Well MW-3.

Even where statistically significant levels were identified, the contaminant levels identified in the wells are well below the MCLs or other applicable criteria. In the August 1995 approved closure plan, post-closure groundwater monitoring was scheduled for a period of five years. Based on the fact that the target parameters, cadmium and lead, were not detected in any groundwater samples, and that only barium and vanadium were detected in groundwater at significant levels, but well below applicable criteria, it is proposed that groundwater monitoring be conducted for a period of

one year. Groundwater samples will be collected on a quarterly basis from Monitor Wells MW-1 through MW-4 for analysis of barium and vanadium. If, after one year of monitoring, levels have decreased or not significantly increased, the monitoring program will be terminated. Quarterly monitoring reports will be submitted to IDEM. After one year an annual report will be submitted to IDEM. If applicable, the report will include a petition to end the monitoring program.

Upon approval of the completion of the groundwater post-closure monitoring program, the monitor wells will be abandoned in accordance with the procedures described in 310 IAC 16-10-2. The Division of Water of the Indiana Department of Natural Resources will be notified within 30 days after completion of well abandonment.

1994 CP

Did not use - all info in Cert. report

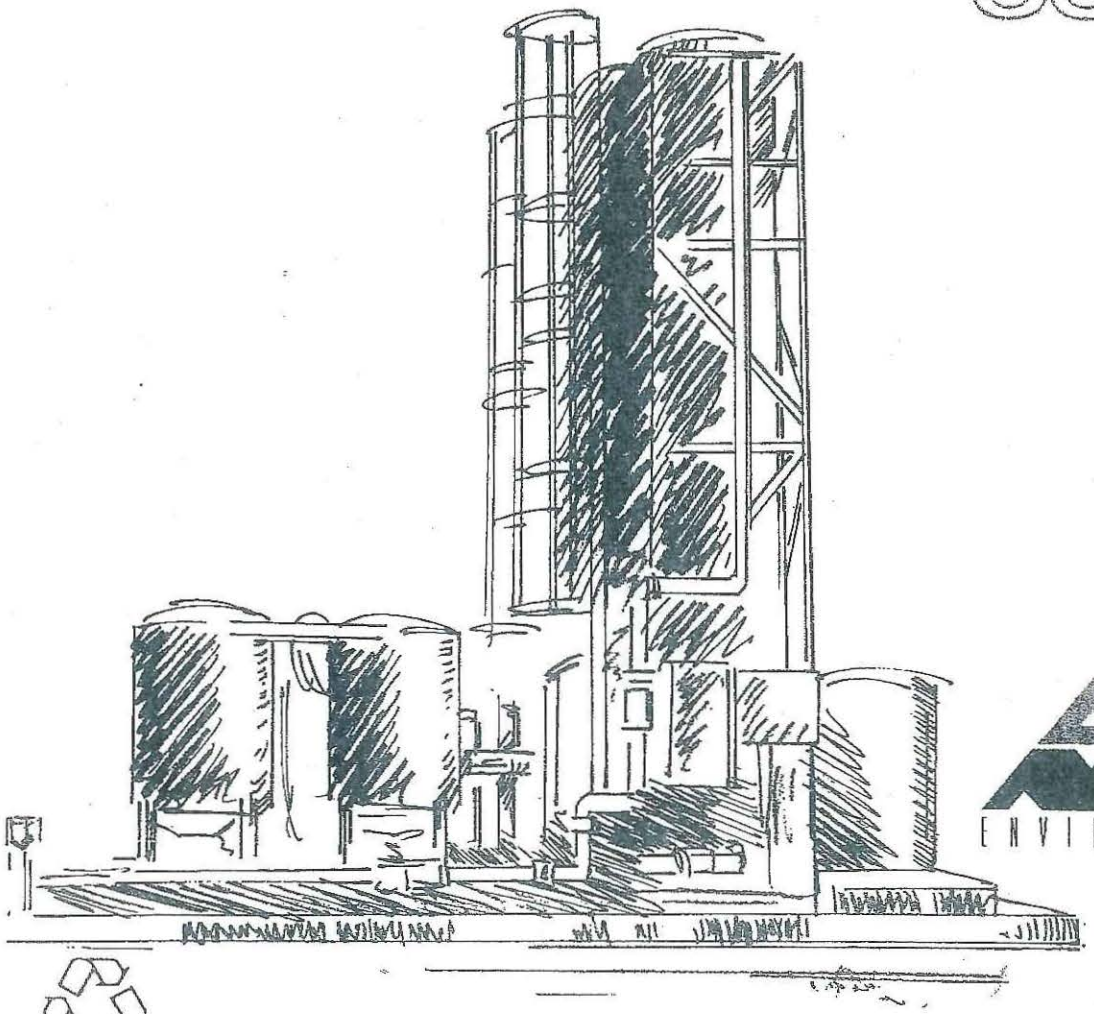
RCRA CLOSURE PLAN
WASTEWATER PONDS AND SLUDGE DRYING AREAS
THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA

AUGUST MACK PROJECT NUMBER 94172.40

PREPARED FOR:
INDIANA DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT

ISSUED: DECEMBER 9, 1994

COPY



AUGUST MACK ENVIRONMENTAL INC

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RCRA CLOSURE PLAN
WASTEWATER PONDS AND SLUDGE DRYING AREAS
THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA
AUGUST MACK PROJECT NUMBER 94172.40

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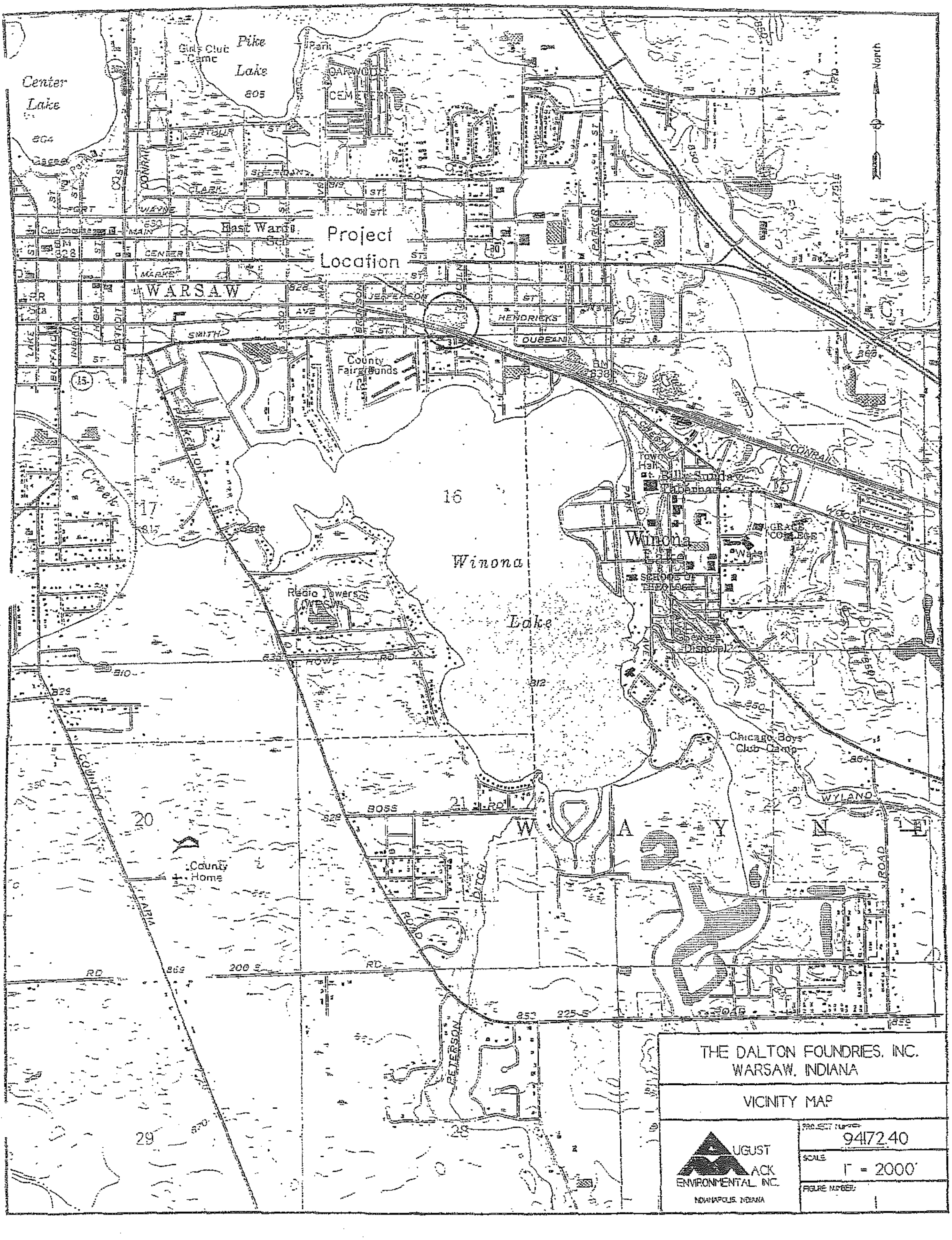
WASTEWATER PONDS AND SLUDGE DRYING AREAS
THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA
AUGUST MACK PROJECT NUMBER 94172.40

INTRODUCTION

The Dalton Foundries, Inc. (Dalton) owns and operates a gray iron foundry in Warsaw, Indiana (SIC 3321). The location of the Dalton plant site is shown in Figure 1. Dalton is in the process of upgrading its wastewater treatment system and plans to remove three settling ponds and adjacent sludge drying areas from service. On June 7, 1994 Dalton approached the Indiana Department of Environmental Management (IDEM) with its intent to clean close these units in accordance with applicable RCRA regulations. This plan provides background information regarding Dalton operations, describes the procedures proposed to clean close the ponds and drying areas, summarizes the hydrogeologic conditions of the site and provides a schedule and cost estimate for closure. A Detection Monitoring Plan has also been prepared to describe the procedures by which Dalton will monitor groundwater in the vicinity of the waste management area in compliance with 329 IAC 3.1-9-1(*40 CFR 264, Subpart F*). This plan and closure financial assurance information have been submitted under separate cover.



THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA

VICINITY MAP

AUGUST MACK ENVIRONMENTAL, INC.
INDIANAPOLIS, INDIANA

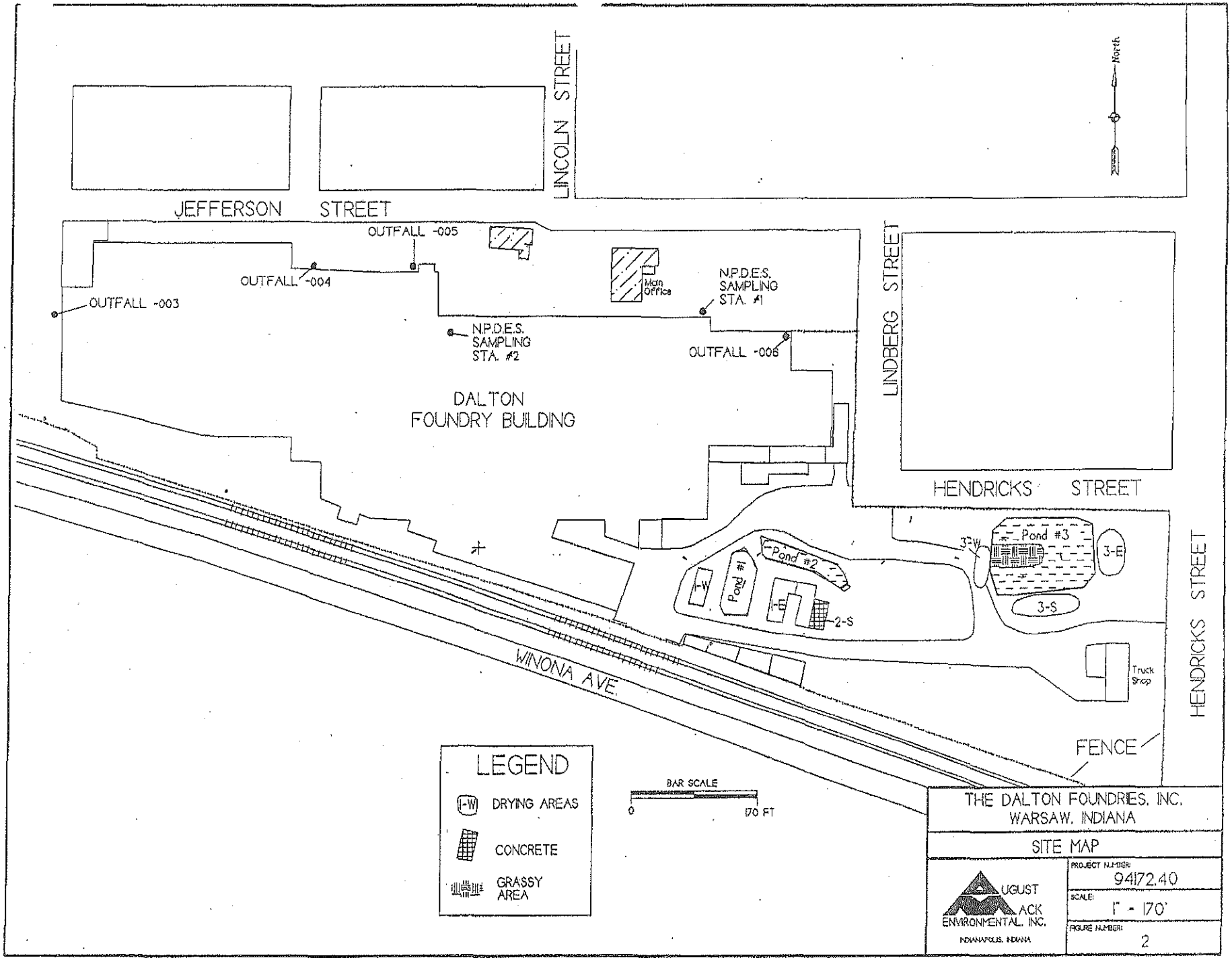
PROJECT NUMBER: 94172.40

SCALE: 1" = 2000'

FIGURE NUMBER: 1

SITE DESCRIPTION & BACKGROUND INFORMATION

Dalton began operations at this site in 1910 as a manufacturer of gray iron castings for the automotive and appliance industries. Dalton, an international company, provides products to Belgium, France, Germany, Japan and Mexico as well as the United States. Current customers within Indiana and the Midwest include Carrier Compressor Company, Caterpillar Incorporated, Copeland Industries and Simpson Industries. Dalton is an employee-owned company and currently occupies an approximately 16 acre plant site, employs approximately 700 people and continues to manufacture gray iron castings. The Dalton facility is entirely fenced with three entrance gates on the east and one entrance gate on the *west* side of the property. All production occurs within the 270,000 square foot foundry building, and a small truck repair and maintenance garage is located near the southeast corner of the plant site. *The plant site has a slight man-made slope to the east resulting in base elevations ranging from approximately 822 feet (ft) to 825 ft above mean sea level (ft msl).* A site plan depicting the features of the plant site is included as Figure 2 while a recent aerial photograph of the facility is provided as Figure 3. Dalton is located in an area of mixed commercial, residential and industrial development. Dalton is bordered to the north by Warsaw Plating company, to the south by active Conrail railroad tracks and to the east and west by residential areas. Surface runoff from the site either discharges to one of three stormwater outfalls (General Permit Number INR00D002) or via sheet flow to storm sewers located east and west of the property.

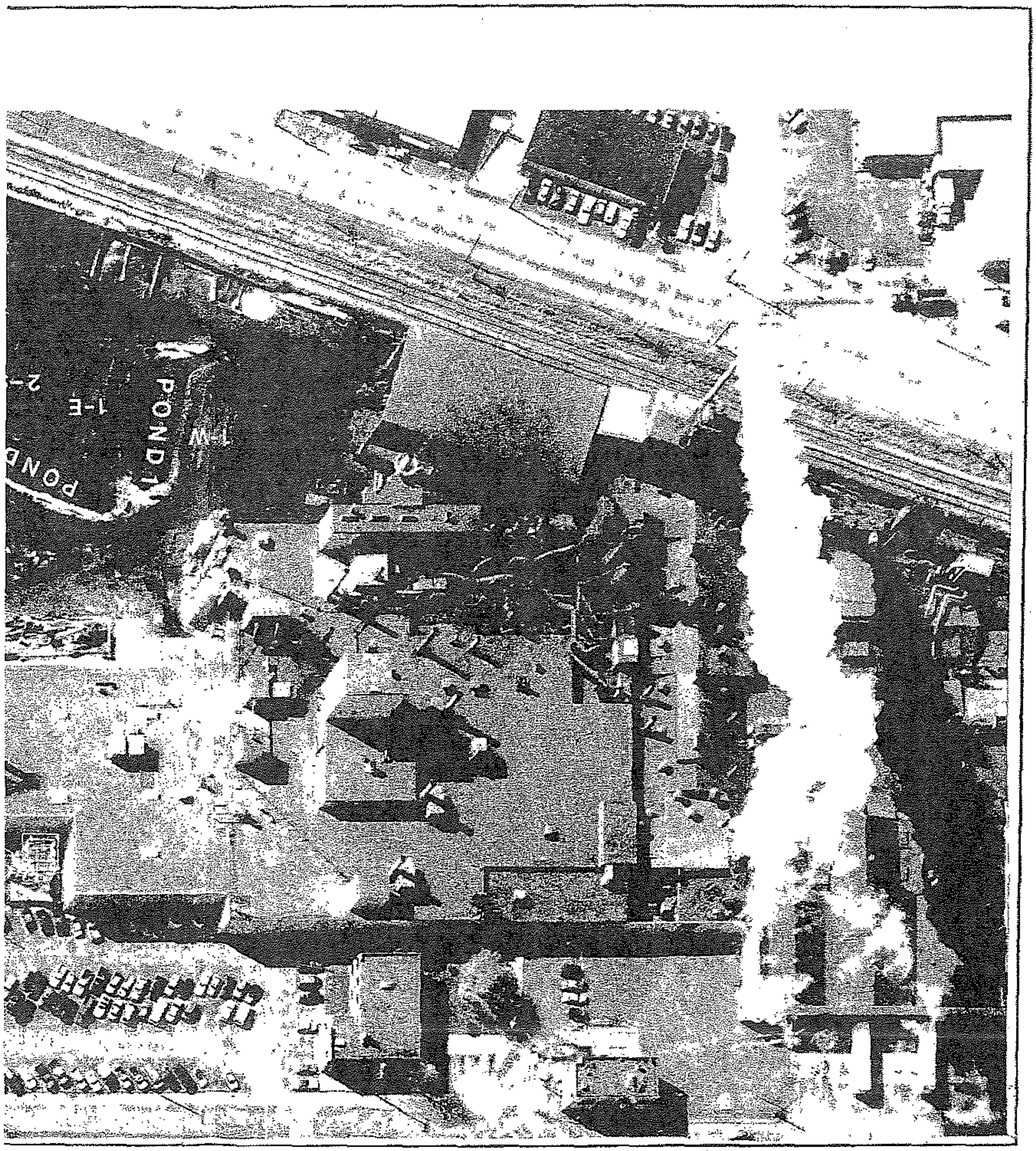


THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA

SITE MAP

AUGUST MACK ENVIRONMENTAL, INC.
INDIANAPOLIS, INDIANA

PROJECT NUMBER: 94172.40
SCALE: 1" = 170'
FIGURE NUMBER: 2


POND 1
1-W
1-E

As stated earlier, Dalton manufactures gray iron castings. Production processes currently in use at the facility include melting, pouring, casting, cooling, shakeout, coremaking, moldmaking, sand handling, grinding, finishing, packaging, shipping and receiving. Dalton also has ancillary facilities for wastewater treatment and recycling. Raw materials include core and molding sand, core binders, bentonite, limestone, coke and steel scrap. Dalton currently maintains an NPDES permit for discharge of non-contact cooling water (NPDES Permit IN0045578).

Site History

In 1969, Dalton became the first foundry in Indiana to install air pollution control systems to control particulate emissions from its sand handling and cupola operations. These systems involve the use of wet scrubbers to remove particulate matter from the air stream prior to exhaust. The scrubber wastewater has been discharged to a series of three holding ponds for solids settling prior to *reuse as make-up water at the plant or discharge to the city of Warsaw publicly owned treatment works. (Pond Numbers 1, 2 and 3 for primary, secondary and tertiary settling, respectively)*. As a part of Dalton's continuing commitment to environmental control and pollution prevention, the air pollution control and wastewater treatment systems have been upgraded and improved several times. Currently, the pond system only receives scrubber water from the sand scrubbing system while the scrubber water from the cupola is recycled.

As a part of normal operations, the ponds are periodically dredged of accumulated solids to restore their holding capacity. These dredgings are placed in sludge drying areas adjacent to the

ponds until they are dewatered sufficiently to be transported off-site and disposed of at Dalton's permitted solid waste monofill (IDEM Operating Permit Number 43-6). *Beginning in the early 1980's, Dalton has been collecting samples of the dried sludge for waste characterization analyses in compliance with the IDEM's foundry waste characterization regulations (329 IAC 2-9-3). These regulations have been established by IDEM to properly characterize foundry waste streams according to the constituents reasonably expected to be present in foundry wastes. The collected samples have been analyzed for Extraction Procedure (EP) Toxic, Toxicity Characteristic Leaching Procedure (TCLP) and State of Indiana Leaching Procedure concentrations for a variety of constituents as listed below:*

Table 1
EP Toxicity Test Parameters

Parameters	*Concentrations (mg/L)*			
	Type IV	*Type III*	*Type II*	*Type I*
Arsenic	*≤0.05*	*≤0.5*	*≤1.25*	*<5.0*
Barium	*≤1*	*≤10*	*≤25*	*<100*
Cadmium	*≤0.01*	*≤0.1*	*≤0.25*	*<1.0*
Chromium	*≤0.05*	*≤0.5*	*≤1.25*	*<5.0*
Lead	*≤0.05*	*≤0.5*	*≤1.25*	*<5.0*
Mercury	*≤0.002*	*≤0.02*	*≤0.05*	*<0.2*
Selenium	*≤0.01*	*≤0.1*	*≤0.25*	*<1.0*
Silver	*≤0.05*	*≤0.5*	*≤1.25*	*<5.0*

Table 2
Leaching Method Test Parameters

Parameters	*Concentrations (mg/L)*			
	Type IV	*Type III*	*Type II*	*Type I*
Barium	≤1	≤10	≤25	*
Boron	≤2	≤20	≤50	*
Chlorides	≤250	≤2,500	≤6,250	*
Copper	≤0.25	≤2.5	≤6.25	*
Cyanide, Total	≤0.2	≤2	≤5	*
Fluoride	≤1.4	≤14	≤35	*
Iron	≤1.5	≤15	*	*
Manganese	≤0.05	≤0.5	*	*
Nickel	≤0.2	≤2	≤5	*
Phenols	≤0.3	≤3	≤7.5	*
Sodium	≤250	≤2,500	≤6,250	*
Sulfate	≤250	≤2,500	≤6,250	*
Sulfide, Total	≤1**	≤5	≤12.5	*
Total Dissolved Solids	≤500	≤5,000	≤12,500	*
Zinc	≤2.5	≤25	≤62.5	*
pH	6-9	5-10	4-11	*

** Testing is not required.*

A copy of the most recent waste characterization data for the pond sludges is included in Appendix A of the Closure Plan.

In addition to the waste characterization analyses performed according to the IDEM foundry waste classification requirements, Dalton has periodically sampled and analyzed the dried sludge for EP toxic and TCLP concentrations of cadmium and lead as these are the constituents most likely to affect the classification of foundry waste. These test results were presented to IDEM in an informational submittal on June 14, 1994 and the results are summarized in Appendix B of the Closure Plan. These sample results have routinely revealed heavy metal

concentrations below the regulatory threshold for hazardous waste characterization and the Type II criteria for foundry waste characterization and, as such, these materials have been managed as non-hazardous solid wastes.

In 1985, EP toxicity testing of drying sludge from Pond #1 revealed for the first time cadmium and lead concentrations above the regulatory thresholds (D006 & D008). Dalton immediately notified the Indiana Department of Environmental Management and Region V of the United States Environmental Protection Agency, secured a hazardous waste generator identification number (IND005146022) and transported and disposed of the material (approximately 450 tons) at a permitted off-site hazardous waste disposal facility (Michigan Disposal MID048090633).

In response to this event, Dalton modified its process by improving the quality of the scrap that it purchased for melting. This minimized the amount of lead and cadmium used in the process which in turn minimized the potential for elevated levels of these constituents in the wastewater and dredgings. This modification was largely successful. Due to the overall improved quality of scrap material used by the facility, and to modifications implemented in the wastewater treatment systems, the level of lead and cadmium detected in the pond sludge and associated drying areas has not exceeded the regulatory thresholds since August, 1992. In 1993, Dalton further improved its wastewater treatment system by installing a recycling system which

eliminated the discharge of the cupola scrubber water to the pond system. This recycling system will be expanded in the near future to recycle the scrubber water from the sand handling systems, eliminating the need for the ponds. Dalton intends to remove the ponds from service and clean close the ponds and drying areas in accordance with the provisions of this plan.

Description of Waste Management Area

The waste management unit that will be closed includes three ponds (surface impoundments) and six sludge drying areas (waste piles). The unit (Pond #1, #2, #3 and drying areas 1-E, 1-W, 2-S, 3-E, 3-W, and 3-S) is shown on the site plan in Figure 2. As indicated previously, the ponds operate in series with the primary settling occurring in Pond #1. Pond #1 was constructed in 1969 and is about 85 ft long, 35 ft wide and about 11 ft deep. It has a maximum capacity of about 217,000 gallons and is lined with compacted clay along the base and sidewalls. The liner is approximately 10 inches thick along the sidewalls and 15 inches thick along the base. Wastewater discharges by gravity from Pond #1 to Pond #2 via a plate weir into a 15 ft long concrete channel between the two ponds. The channel ranges in width from 2 to 6 ft and is about 6 inches deep. Pond #2 was constructed in 1976 and is 120 ft long, 20 ft wide and about 8 ft deep. It has a maximum capacity of 157,000 gallons and is also lined with 10 to 15 inches of compacted clay along the base and sidewalls. Wastewater from Pond #2 discharges by gravity to Pond #3 via 230 ft of eight inch diameter concrete tile. *Pond #3 was constructed in 1974 for storm water retention by Indiana Briquetting who leased this portion of the Dalton property.* In

approximately 1976, Dalton occupied this part of the property and brought Pond #3 into service. Pond #3 is 135 ft long, 100 ft wide and about 7 ft deep. Pond #3 has a maximum capacity of about 564,000 gallons and has concrete sidewalls and a clay lined base. The concrete sidewalls are about 3 inches thick, and the basal compacted clay liner is about 15 inches thick. The final effluent from Pond #3 is pumped at a maximum rate of 120 gallons per minute (gpm) for use as make-up water for the plant via 460 ft of 3 inch diameter polyvinyl chloride (PVC) pipe.

The sludge drying areas are temporary staging areas located adjacent to the ponds where dredged sludges were placed for dewatering prior to off-site disposal. These areas are directly adjacent to each pond, and each area is sloped to drain into the ponds (Figure 2). Two drying areas are adjacent to Pond #1 (#1-E and #1-W, east and west of Pond #1, respectively), one area is adjacent to Pond #2 (#2-S, south of Pond #2) and three areas are adjacent to Pond #3 (#3-E, #3-W, #3-S, east, west and south of Pond #3, respectively). The characteristics of each of the drying areas are summarized in Table 3.

Table 3
Drying Area Characteristics

DRYING AREA	LENGTH (FT)	WIDTH (FT)	DEPTH (FT)	CAPACITY (YD^3)
#1-E	70	22	4	180
#1-W	50	18	5	165
#2-S	70	35	4	240
#3-E	60	35	3	235
#3-W	55	20	2	80
#3-S	90	25	2	165

The drying areas are used only after dredging of the ponds. Ponds are dredged after sludge has accumulated in each. Pond #1 is dredged on a weekly or biweekly basis while Pond #2 is dredged on a monthly basis. Pond # 3 is dredged every two to three years. Sludge is typically stored in the drying areas for a short period of time (usually one to two weeks) until it is sufficiently dewatered. All of these areas will be subjected to clean closure.

CLOSURE PLAN

This closure plan describes the techniques by which Dalton intends to clean close the ponds and sludge drying areas. The plan is designed to comply with the requirements for closure of RCRA hazardous waste management units as codified in Article 3.1 of Title 329 of the Indiana Administrative Code (IAC) which are the Final Permitted Facility Standards for Closure and Post-Closure. The plan is also designed to comply with the requirements of 329 IAC 3.1-9-1*(40 CFR 264, Subpart K)* and 329 IAC 3.1-9-1*(40 CFR 264, Subpart L)* which are the specific closure requirements for surface impoundments and waste piles, respectively. Additionally, Dalton intends to demonstrate compliance with 3.1-9-1*(40 CFR 264, Subpart F)* of Title 329 of the Indiana Administrative Code which are the Final Permitted Facility Standards for Groundwater Protection by implementing a detection monitoring program. *All personnel involved with the implementation of this closure plan and the detection monitoring plan will be required to have at least 40 hours of hazardous waste operations health and safety training in*

accordance with Occupational Safety and Health Association (OSHA) regulations outlined in 29 CFR 1910.120, including annual eight hour refresher training.

Closure Performance Standard

Dalton intends to comply with the closure performance standard specified in 329 IAC 3.1-9-1*(40 CFR 264, Subpart G)* by removing all hazardous waste and hazardous waste residues from the ponds and drying areas in accordance with the provisions of 329 IAC 3.1-9-1*(40 CFR 264, Subpart K)*. This type of closure eliminates the need for further maintenance and controls, and minimizes or eliminates the post-closure escape of hazardous waste or hazardous constituents. Dalton will also develop a contingent closure plan pursuant to 329 IAC 3.1-9-1*(40 CFR 264, Subpart K)* if it becomes apparent that hazardous waste residues will be left in place.

Maximum Waste Inventory

As indicated previously, the ponds and drying areas never received hazardous waste on a routine basis. However, during the 1985 episode, a total of about 450 tons of hazardous waste (D006 and D008) was generated which is believed to be the maximum amount of hazardous waste generated at any one time. As such, the maximum waste inventory as required by 329 IAC 3.1-9-1(40 CRF 264, Subpart G) is 450 tons.

Closure Procedures

Closure of the ponds and drying areas will be accomplished in three main phases. Phase I will involve removal of the current waste inventory, Phase II *will involve* characterization and removal of any residual soil or liner contamination and Phase III will be site restoration. The first phase will involve characterizing the wastes currently stored in the ponds and in the drying areas to determine if they exhibit hazardous waste characteristics. Any wastes within the ponds or drying areas which are characteristically hazardous will be treated in-place to Type II foundry waste classification levels, excavated and disposed at Dalton's permitted solid waste monofill. After removal of any hazardous wastes from the unit, the existence of any residual contamination of surrounding soils or liner systems will be determined by implementation of a sampling and analysis program during the second phase of closure. If residual contamination is present, the contaminated materials will either be removed and directly disposed of in the Dalton monofill (if within the Type II criteria) or removed and pretreated to meet the Type II criteria and then disposed of in the monofill. *A complete description of the treatment, removal and disposal activities to be implemented in Phase II can be found in the Treatment, Removal and Disposal Plan (TRDP) in Appendix C.* The third phase will involve restoring the site by backfilling and regarding the area.

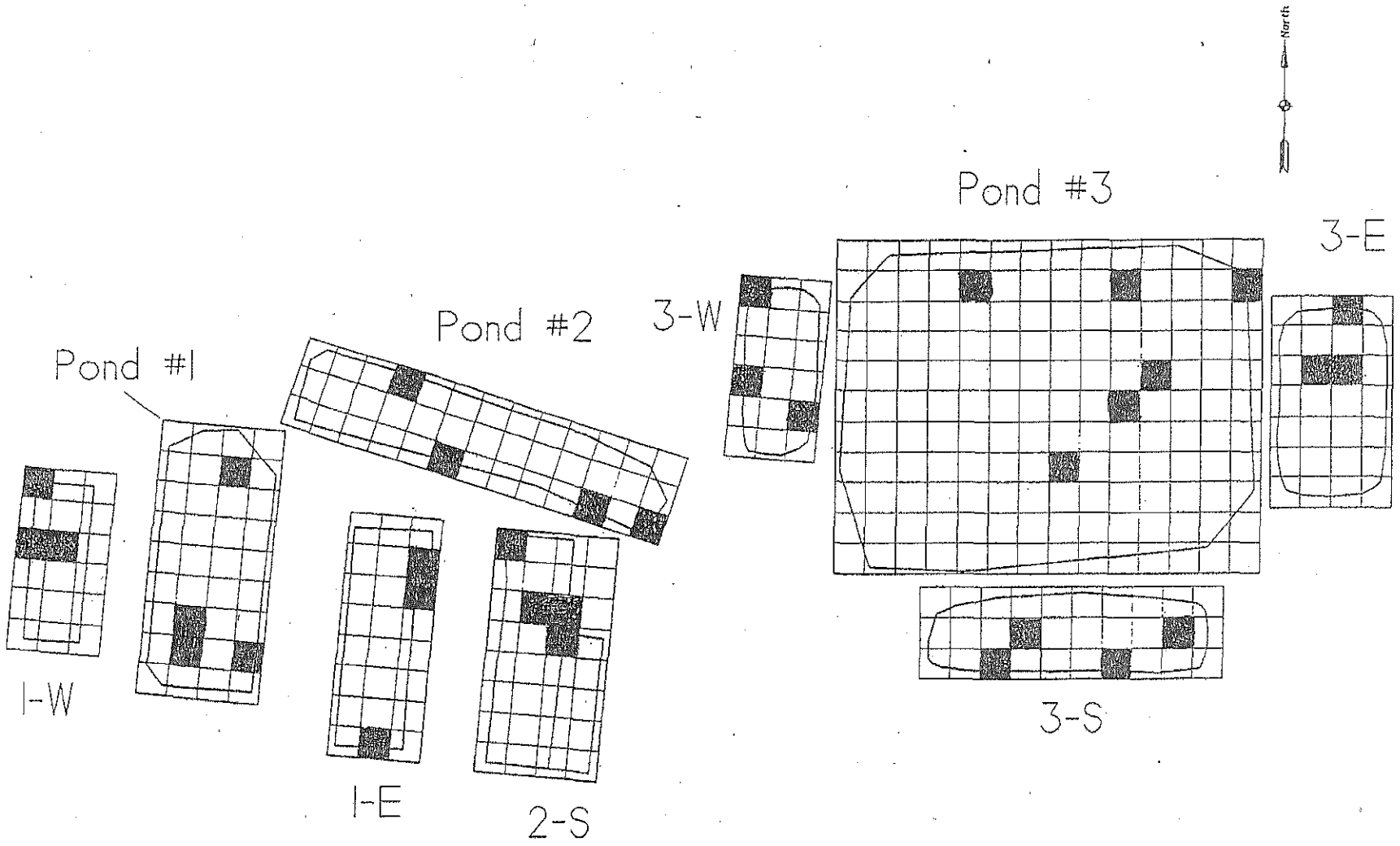
Phase I - Waste Characterization and Removal

In order to determine if the pond and drying areas currently contain hazardous wastes, Dalton intends to implement a waste characterization program. The characterization will involve

collecting representative samples of sludge from the ponds and the drying areas and analyzing them for TCLP lead and cadmium (D006 and D008). *The TCLP extraction will be conducted using US EPA Method 1311 as described in the US EPA document entitled "Test Methods for Evaluating Solid Wastes - Physical/Chemical Methods, 3rd Edition" (SW-846). Lead and cadmium testing will be conducted using SW-846 Method 6010.* The Quality Assurance Project Plan (QAPP) for all aspects of this project is included in Appendix D.

In order to determine if hazardous waste is present in the ponds and drying areas, each unit will be subjected to sampling. A 10 ft by 10 ft sampling grid will be superimposed over each area and samples will be collected from grid locations selected using a random number generator. The number of samples to be collected from each unit will be the cube root of the total number of grid intersection points for each waste management unit. The location of the sampling points for each unit is shown in Figure 4 while waste sampling procedures are outlined in the Project Sampling and Analysis Plan (PSAP) included in Appendix E.

After receipt of the data, the results will be compared to the regulatory threshold for hazardous waste characterization. For TCLP lead, the threshold is 5.0 parts per million (ppm) while for cadmium the threshold is 1.0 ppm. Any material that exceeds this threshold value will be treated in-place to reduce the levels to the Type II foundry waste thresholds, removed and disposed of at the Dalton monofill. The Type II foundry waste thresholds are based on EP toxicity testing and



THE DALTON FOUNDRIES, INC.
WARSAW, INDIANA

WASTE MANAGEMENT AREA
SAMPLING LOCATIONS

AUGUST MACK ENVIRONMENTAL, INC.
INDIANAPOLIS, INDIANA

PROJECT NUMBER: 9417Z.40
SCALE: 1" = 50'
FIGURE NUMBER: 4

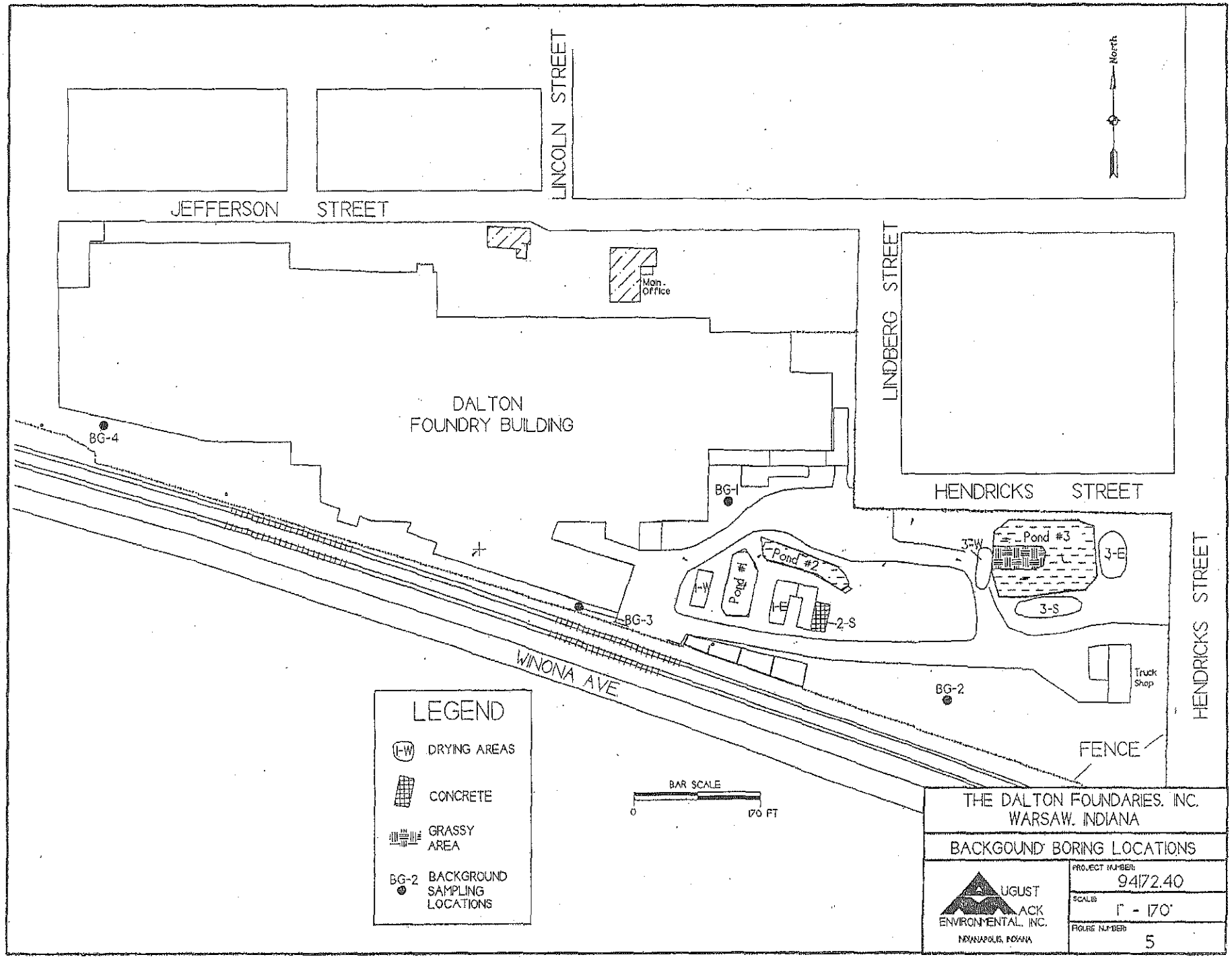
are 1.25 ppm for lead and 0.25 for cadmium. Additionally, during removal of any waste, the weir and channel between Pond #1 and Pond #2 and the piping between Pond #2 and Pond #3 will be decontaminated. Procedures for removal and off-site disposal of any hazardous waste identified or generated during this project, and decontamination of the ancillary equipment, are included in the TRDP in Appendix C.

Phase II - Soil/Liner Characterization and Removal

After all hazardous wastes have been removed from the waste management unit, an investigation of the existence of residual liner and soil contamination will be conducted. The unit will be characterized by collecting soil and liner samples at locations established using the grid procedures described above for the Phase I waste characterization, however, thirty-four (34) new locations will be randomly selected for this sampling event to provide further characterization of the waste management units. Soil/liner samples will be collected in six inch increments from borings drilled to depths down to 2 ft, in one ft intervals from 2 to 5 ft, and in 5 ft intervals below 5 ft using the soil/liner sampling procedures in the PSAP. The samples will be analyzed from the top-down for total lead and cadmium using the procedures specified in the QAPP until two consecutive samples meet the clean closure limits (CCLs) established for this project. If the vertical extent of contamination has not been defined by this sampling, deeper borings will be drilled at that location until the naturally occurring groundwater table is encountered.

The horizontal extent of contamination will be defined by drilling additional borings laterally along the ordinal directions around the location which exceeded the CCLs. The first adjacent borings will be placed in the adjacent grid intervals (i.e. 10 ft away), and if this location exceeds the CCLs, the next boring will be placed two grid intervals away from the adjacent boring (i.e. 30 ft from the original boring). If this location also exceeds the CCLs, the next boring will be placed three grid intervals from this location. This procedure will be repeated as necessary until the horizontal extent is defined. Although the method for determining the extent of contamination described above is the most likely method to be implemented at the site, alternative methods may be considered after the initial rounds of sample collection. If Dalton intends to implement such an alternative, plans for such an approach will be submitted to IDEM for approval prior to implementation.

The sampling results will be compared to the CCLs established for this project. Clean closure limits will be established as site-specific background levels for lead and cadmium. *The background levels will be calculated by collecting composite soil samples from four soil borings at the locations shown in Figure 5 which are suspected to be in the same geologic units as the ponds and drying areas but are in areas which have not been subjected to waste management activities.* Composite samples from the four soil borings will be collected from each soil horizon encountered above the naturally occurring groundwater table and will be subjected to lead and


LINCOLN STREET
North
JEFFERSON STREET
Main-Office
LINDBERG STREET
DALTON FOUNDRY BUILDING
BG-4
BG-1
HENDRICKS STREET
Pond #3
3-W
3-E
3-S
Pond #2
Pond #1
1-W
1-E
2-S
BG-3
WINONA AVE.
BG-2
Truck Shop
HENDRICKS STREET
FENCE
LEGEND
1-W DRYING AREAS
CONCRETE
GRASSY AREA
BG-2 BACKGROUND SAMPLING LOCATIONS
BAR SCALE
0
170 FT
THE DALTON FOUNDARIES. INC.
WARSAW. INDIANA
BACKGOUND BORING LOCATIONS
AUGUST MACK ENVIRONMENTAL, INC.
INDIANAPOLIS, INDIANA
PROJECT NUMBER: 9472.40
SCALE: 1" - 170'
FIGURE NUMBER: 5

cadmium analysis using the same techniques as the soil/liner characterization samples. Background levels will be defined as the mean contaminant concentrations for the lithologic unit plus three standard deviations. At this time background levels are expected to be established for the on-site fill material, the silty sand unit and the sand unit as defined in the hydrogeologic assessment section of the Detection Monitoring Plan. *Since air pollution control systems have been controlling particulate emissions at Dalton for 25 years, and since composite samples for background concentrations will be collected from the ground surface to the groundwater table (approximately seven to twelve ft below land surface (bls)), it is anticipated that the background sampling locations will yield samples which contain lead and cadmium in concentrations which are representative of the Warsaw area.* Background sampling will be conducted using the procedures in the PSAP.

After comparing the sample results to the CCLs, Dalton will compute the nature and extent of contamination and determine the remediation options. The preferred option at this time will be to remove the contaminated material as described in the TRDP. If it becomes apparent that this remedial approach in combination with the CCLs is prohibitive, Dalton will investigate alternative remedial options (including closure in-place) or will establish alternative clean closure limits (ACLs) by risk assessment or other appropriate methodology.

Phase III - Site Restoration

After sampling indicates compliance with the CCLs or ACLs established for this project, remediation will be considered complete and the site will be restored. Restoration will involve backfilling the ponds and the drying areas (if necessary) with clean fill and regrading the area. *If contamination has not penetrated the liners of the ponds and the drying areas, the liners of the ponds and drying areas will be left in place prior to backfilling.* The area will then be returned to useful service and on-site closure activities will be complete.

DETECTION MONITORING PLAN

Dalton has developed a groundwater detection program designed to comply with the requirements of 329 IAC 3.1-9-1*(40 CFR 264, Subpart F)*. This program will be capable of determining if hazardous constituents from the ponds or drying areas are present at the downgradient limit of the waste management area (i.e. the compliance point). Dalton will implement this program on an accelerated basis to expedite closure of these units. The Detection Monitoring Plan is included in a separate submittal.

CLOSURE REPORTING

Within 60 days of completion of closure activities, a certification report will be prepared documenting the closure of the ponds and drying areas and certifying that the closure was conducted in accordance with the approved closure plan. The report will include a description of the field activities performed, laboratory analytical data and quality assurance/quality control

(QA/QC) documentation, waste disposal documentation, a photographic log and any other pertinent closure data. The report will include the closure certification statement and will be signed by a responsible corporate official from Dalton and by an independent registered professional engineer (P.E.).

CLOSURE SCHEDULE

The following is an anticipated schedule for final closure of the Dalton ponds and drying areas. This schedule will commence upon IDEM approval of this closure plan. Finally, this closure schedule complies with all timing requirements set fourth in 329 IAC 3.1-9-1*(40 CFR 264, Subpart G)*.

Table 4
Closure Schedule

TASK	COMPLETION DATE	ELAPSED DAYS
Submit Closure Plan	September 9, 1994	
IDEM Approval	September 23, 1994	0
Project Set-up	October 10, 1994	7
Waste Characterization and Removal	January 10, 1995	22
Soil/Liner Characterization and Removal if Required	March 31, 1995	180
Site Restoration	April 14, 1995	195
Closure Reporting	May 31, 1995	240

If the closure plan does not receive IDEM approval within the above time frame, all subsequent activities will be performed on a similar schedule following approval. If due to unforeseen circumstances additional time is required to complete closure, Dalton will request an extension of

closure at least 30 days prior to May 31, 1995 pursuant to the requirements of 329 IAC 3.1-9-1*(40 CFR 264, Subpart G).*

CLOSURE/POST-CLOSURE COST ESTIMATE

Dalton has prepared a cost estimate associated with closure of its ponds and drying areas. The closure cost estimate has been developed in accordance with the requirements for 329 IAC 3.1-15. The base closure cost estimate is $555,875 as shown in the detailed cost breakdown included in Appendix F. Assuming a 10% contingency for unforeseen circumstances, the total closure cost estimate is $611,463. The base cost assumes that the maximum waste inventory (450 tons) will be removed from the ponds and drying areas, and that 5 ft of affected soil/liner material will be removed beneath the ponds and 2 ft of soil/liner material beneath the drying areas. This cost assumes that all waste and soil/liner material will be treated in-situ, excavated, transported and disposed of at an IDEM approved special waste landfill. The base post-closure cost estimate is $210,000 and involves maintenance of the groundwater monitoring system for five years after clean closure. Assuming a 10% contingency for unforeseen circumstances, the total post closure cost estimates is *$231,000*. The cost is based on continuing the detection monitoring plan described in a separate submittal. This cost is based on engineering estimates prepared by August Mack with all work being conducted by third party contractors. Dalton's financial assurance for closure is provided under separate cover.

APPENDIX A

Pond Sludge Waste Characterization Data

ANALYTICAL REPORT

Client:
Mr John Kimpel
The Dalton Foundries, Inc.
1900 E Jefferson; P.O. Box 1388
Warsaw, Indiana 46580
219-372-1804 (FAX 219-372-1890)

Report Date: 7-29-94
EIS Lab No: 18091
EIS Project No: 1005-8938
EIS Priority: 4
Client P.O.#: 195280-B
Certification: Indiana Drinking Water Certificate No. C-71-02

Invoice To:
Client

SAMPLE IDENTIFICATION
Sample ID: 94-36 (SLUDGE)
Waste Stream
Date Sampled: 6-24-94
Date Received: 6-28-94

Report To: CLIENT

Extra Report To:

PARAMETER	UNITS	RESULT	DL	TEST DATE	ANALYST	QUALITY CONTROL RSD %	QUALITY CONTROL MS %R
Arsenic,TCLP	mg/l	<0.1	0.1	07-05-94	Clear,N	0	98
Barium,TCLP	mg/l	0.72	0.05	07-05-94	Clear,N	2.0	95
Cadmium,TCLP	mg/l	<0.03	0.03	07-05-94	Clear,N	0	91
Chromium,TCLP	mg/l	<0.03	0.03	07-05-94	Clear,N	0	91
Copper,TCLP	mg/l	0.08	0.03	07-05-94	Clear,N	18	96
Lead,TCLP	mg/l	<0.1	0.1	07-05-94	Clear,N	0	90
Mercury,TCLP	mg/l	<0.005	0.005	07-12-94	Shane,D		94
Nickel,TCLP	mg/l	<0.03	0.03	07-05-94	Clear,N	0	92
Selenium,TCLP	mg/l	<0.1	0.1	07-05-94	Clear,N	0	98
Silver,TCLP	mg/l	<0.03	0.03	07-05-94	Clear,N	0	100
Zinc,TCLP	mg/l	1.90	0.03	07-05-94	Clear,N	2.2	90
SVOC,TCLP		*		07-15-94	Geels,S		
VOC,TCLP		*		07-13-94	Myers,N		

* See Attached TCLP ORGANICS REPORT

Mercury Digestion,TCLP	07-11-94	Shane,D
Metals Digestion ICP,TCLP	07-01-94	Shane,D
SVOC Extraction,TCLP	07-06-94	Geels, S

QUALITY ASSURANCE OFFICER

LABORATORY DIRECTOR

EIS ENVIRONMENTAL ENGINEERS, INC. • 1701 North Ironwood Drive • South Bend, Indiana 46635 • 219/277-5715

TCLP ORGANICS REPORT

SAMPLE ID: 94-36 (SLUDGE)
Waste Stream

REPORT DATE: 07/29/94
EIS LAB NO: 18091

VOLATILE ORGANICS	- - mg/l - - RESULT	PQL	%R
Benzene	ND	0.02	100
Carbon Tetrachloride	ND	0.02	105
Chlorobenzene	ND	0.02	101
Chloroform	ND	0.02	101
1,4-Dichlorobenzene	ND	0.02	95
1,2-Dichloroethane	ND	0.02	110
1,1-Dichloroethylene	ND	0.02	99
Methyl Ethyl Ketone	ND	0.2	108
Tetrachloroethylene	ND	0.02	105
Trichloroethylene	ND	0.02	110
Vinyl Chloride	ND	0.1	84
SEMI-VOLATILE ORGANICS			
o-Cresol	ND	0.1	59
m-Cresol	ND	0.1	
p-Cresol	ND	0.1	58
Total Cresols	ND	0.3	
2,4-Dinitrotoluene	ND	0.1	63
Hexachlorobenzene	ND	0.1	59
Hexachloro-1,3-butadiene	ND	0.1	35
Hexachloroethane	ND	0.1	45
Nitrobenzene	ND	0.1	53
Pentachlorophenol	ND	1.0	52
Pyridine	ND	0.1	55
2,4,5-Trichlorophenol	ND	1.0	52
2,4,6-Trichlorophenol	ND	0.1	56

NOTES
1. ND = Not Detected at the PQL shown
2. PQL = Practical Quantitation Limit = Detection Limit
3. %R = Matrix Spike Recovery and is reported if performed on this sample.

EIS Lab No: 18091(continued)

PARAMETER	UNITS	RESULT	TEST DATE	ANALYST
TCLP Extract Formation				
Extraction Started			06-29-94	Wright,C
Extraction Completed			06-30-94	Wright,C
Solids Content	percent	100		
Sample Weight Extracted	grams	100.2		
Filter Used (Whatman)	type	GF/F		
Initial Ph	SU	8.9		
Ph After Acid Addition	SU	1.7		
Extraction Fluid Used	number	1		
Extraction Fluid Amount	ml	2,000		
Extraction Fluid Ph	SU	4.97		
Final Extract Ph (18hrs)	SU	5.0		
TCLP Extract Formation (ZHE)				
Extraction Started			07-05-94	Nye,D
Extraction Completed			07-06-94	Nye,D
Solids Content	percent	100		
Sample Weight Extracted	grams	9.0		
Filter Used (Whatman)	type	GF/F		
Extraction Fluid Used	number	1		
Extraction Fluid Amount	ml	180		
Extraction Fluid Ph	SU	4.91		

ADDITIONAL INFORMATION

1. Chain-of-Custody document is enclosed.
2. Reference Analytical Methods are enclosed.
3. Sample container(s) were properly preserved per USEPA protocols.
4. < = Not Detected at the Detection Limit (DL) shown.
5. DL = Detection Limit and is adjusted for dilutions/concentrations.
6. Quality Control definitions are as follows:
   %RSD = Precision of replicate analysis for this sample.
   %R = Matrix Spike(MS) recovery.
7. Inorganic Quality Control limits are enclosed.
8. Batch [organic] Quality Control data is enclosed. This data was generated at the time that this sample was analyzed but was performed on a different sample.

APPENDIX B

Historical Laboratory Data

HISTORICAL LABORATORY DATA
PONDS AND ASSOCIATED DRYING AREAS

DATE	LABORATORY	ANALYSIS	LOCATION	LEAD (ppm)	CADMIUM (ppm)
1984					
5-17-84	EIS	EP	#2 Pond	0.80	0.04
5-17-84	EIS	EP	#3 Pond	<0.05	<0.01
6-1-84	EIS	EP	#3 Pond	0.10	<0.02
1985					
2-1-85	EIS	EP	#1 Pond	72.00	1.97
2-8-85	EIS	EP	#1 Pond	113.00	7.20
2-14-85	EIS	EP	#1 Pond	95.00	2.20
2-20-85	EIS	EP	#1 Pond	0.49	0.05
3-1-85	EIS	EP	#1 Pond	<0.20	<0.05
4-2-85	EIS	EP	W. drying area	106.00	3.00
4-25-85	EIS	EP	#1 Pond	2.40	0.24
1986					
2-28-86	EIS	EP	E. settling tank	<0.05	0.02
2-28-86	EIS	EP	N. settling tank	<0.05	<0.01
2-28-86	EIS	EP	S. settling tank	<0.05	<0.01
1988					
4-13-88	EIS	EP	E. settling tank	0.02	0.03
4-13-88	EIS	EP	N. settling tank	0.01	<0.01
4-13-88	EIS	EP	S. settling tank	<0.01	<0.01
1990					
1-18-90	EIS	TCLP	#2 Pond	<0.20	0.58
1991					
5-13-91	EIS	TCLP	#1 Pond	7.50	2.41
7-16-91	EIS	TCLP	#1 Pond	13.40	0.73
8-22-91	EIS	TCLP	#1 Pond	1.07	0.29
8-26-91	PCS	TCLP	#1 Pond	3.50	0.49
11-13-91	EIS	TCLP	#1 Pond	0.57	0.64
1992					
6-3-92	EIS	EP	#1 Pond	3.96	1.65
6-3-92	EIS	TCLP	#1 Pond	26.50	2.03
6-8-92	EIS	TCLP	#1 Pond	3.80	0.35
6-9-92	EIS	TCLP	#1 Pond	2.90	0.30
6-24-92	EIS	TCLP	#1 Pond	<0.10	<0.03
7-23-92	RMT	TCLP	#1 Pond	0.65	0.49
7-23-92	RMT	TCLP	#1 drying area	2.50	0.81
8-3-92	RMT	TCLP	#1 Pond	0.58	0.50
8-3-92	EIS	TCLP	#1 Pond	0.19	0.76

HISTORICAL LABORATORY DATA
PONDS AND ASSOCIATED DRYING AREAS
(continued)

DATE	LABORATORY	ANALYSIS	LOCATION	LEAD (ppm)	CADMIUM (ppm)
8-3-92	EIS	TCLP	#2 Pond	0.66	1.04
8-3-92	EIS	TCLP	#3 Pond	15.50	0.03
8-3-92	EIS	TCLP	#1 drying area	4.02	1.23
8-3-92	EIS	Neutral Leachate	#1 Pond	<0.01	<0.001
8-15-92	EIS	TCLP	#1 Pond	<0.10	0.61
8-15-92	EIS	TCLP	#1 drying area	<0.10	0.59
8-15-92	EIS	Neutral Leachate	#1 Pond	<0.01	<0.001
8-15-92	EIS	Neutral Leachate	#1 drying area	<0.01	<0.001
8-22-92	EIS	TCLP	#1 Pond	<0.10	<0.03
8-22-92	EIS	TCLP	#1 drying area	<0.10	<0.03
8-22-92	EIS	TCLP	#2 drying area	<0.10	0.19
8-22-92	EIS	TCLP	#3 drying area	<0.10	<0.03
8-31-92	EIS	TCLP	#1 Pond	0.16	0.78
9-4-92	EIS	TCLP	#1 Pond	0.11	0.86
9-11-92	EIS	TCLP	#1 Pond	0.11	0.92
9-21-92	EIS	TCLP	#1 Pond	<0.10	0.43
9-24-92	EIS	TCLP	#1 Pond	0.13	0.42
9-24-92	EIS	TCLP	#3 E. drying area	<0.10	0.45
9-24-92	EIS	TCLP	#3 S. drying area	0.12	0.21
9-24-92	EIS	TCLP	#3 W. drying area	<0.10	0.38
10-1-92	EIS	TCLP	#1 Pond	0.34	0.82
10-1-92	EIS	TCLP	#1 drying area	0.22	0.45
10-9-92	EIS	TCLP	#1 Pond	0.14	0.38
10-15-92	EIS	TCLP	#1 Pond	0.16	0.37
10-22-92	EIS	TCLP	#2 drying area	<0.10	<0.03
10-22-92	EIS	TCLP	#3 drying area	<0.10	<0.03
10-24-92	EIS	TCLP	#1 Pond	0.15	0.75
11-2-92	EIS	TCLP	#1 Pond	<0.10	0.13
11-2-92	EIS	TCLP	#1 drying area	<0.10	<0.03
11-2-92	EIS	TCLP	#3 E. drying area	0.26	0.42
11-5-92	EIS	TCLP	#1 Pond	0.13	0.41
11-13-92	EIS	TCLP	#1 Pond	0.22	0.29
11-13-92	EIS	TCLP	#3 W. drying area	0.14	0.33
11-13-92	EIS	TCLP	#3 E. drying area	<0.10	0.24

HISTORICAL LABORATORY DATA
PONDS AND ASSOCIATED DRYING AREAS
(continued)

DATE	LABORATORY	ANALYSIS	LOCATION	LEAD (ppm)	CADMIUM (ppm)
11-18-92	EIS	TCLP	#1 Pond	0.20	0.28
12-4-92	EIS	TCLP	#1 Pond	<0.10	<0.03
12-4-92	EIS	TCLP	#2 S. drying area	<0.10	0.11
12-4-92	EIS	TCLP	#3 W. drying area	<0.10	0.17
12-4-92	EIS	TCLP	#3 S. drying area	<0.10	0.03
12-4-92	EIS	TCLP	#3 E. drying area	<0.10	0.22
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1-8-93	EIS	TCLP	#1 Pond drying area	<0.10	0.22
1-8-93	EIS	TCLP	#2 Pond drying area	<0.10	0.16
1-16-93	EIS	TCLP	#1 Pond drying area	0.38	0.51
1-16-93	EIS	TCLP	#1 Pond drying area	0.82	0.40
1-16-93	EIS	TCLP	#3 W. drying area	0.13	0.29
2-1-93	EIS	TCLP	#1 Pond drying area	<0.10	<0.03
2-1-93	EIS	TCLP	#1 drying area	0.22	0.28
2-1-93	EIS	TCLP	#3 E. drying area	<0.10	<0.03
2-1-93	EIS	TCLP	#3 S. drying area	<0.10	<0.03
2-1-93	EIS	TCLP	#3 W. drying area	<0.10	<0.03
2-26-93	EIS	TCLP	#3 W. drying area	1.40	0.18
2-26-93	EIS	TCLP	#3 S. drying area	1.16	0.26
2-26-93	EIS	TCLP	#1 W. drying area	0.18	0.45
2-26-93	EIS	TCLP	#1 E. drying area	<0.10	0.29
2-26-93	EIS	TCLP	#2 S. drying area	<0.10	0.38
3-8-93	EIS	TCLP	#3 drying area	<0.10	0.11
3-15-93	EIS	TCLP	#1 drying area	0.13	0.15
3-15-93	EIS	TCLP	#3 drying area	<0.10	0.10
4-6-93	EIS	TCLP	#1 drying area	<0.10	<0.03

ppm = parts per million
EIS = EIS Environmental engineers, Inc.
PCS = Pollution Control Systems
RMT =
TCLP = Toxicity Characteristic Leaching Procedure
EP = Extraction Procedure (EP) Toxic
N. = North
E. = East
W. = West
S. = South